Total Quality Management

The QIC Story

Team Leader Manual

Competitive Advantage Through Management Technologies
Total Quality Management is a system highly dependent upon people and facts. By combining the communication needs of people with the quantitative and visual power of statistical tools, a common language has been developed - the Quality Improvement and Control (QIC) Story®.

This manual has been developed to familiarize the prospective team member with the Total Quality Management System, the QIC Story, and supporting statistical tools and techniques. Practical and regular application of the QIC Story by all levels of the organization can lead to bottom line results through individual and organization wide continuous improvement.

The team at Competitive Technologies International is eager to support you in the application of these concepts and tools. Please contact us regarding any advice you may need.

Robert H. Seemer
President and CEO
Competitive Technologies International, Inc.
1-407-638-0099
1-407-638-0095 (Fax)
www.ctifl.com
ABOUT COMPETITIVE TECHNOLOGIES INTERNATIONAL

Competitive Technologies International is founded upon the vision that we have entered an era of global cooperation and unity in which Quality plays an integral part. Our mission is to help set a new standard of excellence in the management systems of this era. We are dedicated to the process of continuous improvement for the benefit of all people.

ACKNOWLEDGMENTS

We offer our deepest appreciation to all the organizations that have given us the opportunity to work with them and who continue to show us how much more there is to learn.

Copyright © 1997 by: Competitive Technologies International, Inc. All Rights Reserved
1384 Heritage Acres Blvd., Suite B
Rockledge, FL 32955
1-407-638-0099
1-407-638-0095 (FAX)

This document was produced and printed with pride in the United States of America for the purpose of promoting Total Quality Management concepts throughout the world.

This book may not be reproduced in whole, in any form or by any means, electronic or mechanical, including photocopying, recording, scanning or by any information storage and retrieval system not known or hereafter invented, without written permission from CTi, Inc.
UNIT 1 Total Quality Management (TQM) Overview

UNIT 2 Teams and Roles

UNIT 3 The QIC Story® - Steps, Objectives and Checkpoints

UNIT 4 The Seven Basic Quality Control (QC) Tools

UNIT 5 Techniques

UNIT 6 Leadership

UNIT 7 Group Dynamics

UNIT 8 Glossary of Terms

UNIT 9 Forms

The Quality Improvement and Control (QIC) Story is a registered trademark of CTi, Inc.
QC TOOLS

1. Cause and Effect Diagram  ........................................... 4-5
2. Checksheet  .............................................................. 4-9
3. Control Chart  ............................................................ 4-12
4. Graphs  ....................................................................... 4-19
   a. Bar Graph  ............................................................. 4-21
   b. Line Graph  ............................................................ 4-23
   c. Pie Chart  .............................................................. 4-25
5. Histogram  ..................................................................... 4-27
6. Pareto Chart  .............................................................. 4-34
7. Scatter Diagram  ......................................................... 4-37

TECHNIQUES

1. Action Plan  .................................................................. 5-1
2. Barriers and Aids  ....................................................... 5-3
3. Brainstorming  ............................................................ 5-5
4. Consensus  .................................................................... 5-8
5. Countermeasures Matrix  ............................................. 5-10
6. Cost-Benefit Analysis  .................................................. 5-14
7. Flow Chart  ................................................................... 5-16
8. Multivoting  .................................................................. 5-18
9. Pairwise Ranking  ....................................................... 5-20
10. Poka-Yoke  .................................................................. 5-23
11. Problem Statement  ..................................................... 5-25
12. Project Planning Worksheet ......................................... 5-28
13. Radar (Spider) Chart  ................................................... 5-32
14. Survey - Interview Form  ............................................. 5-34
15. Theme Selection Matrix  .............................................. 5-36
LEADERSHIP

- Effective Meetings ........................................... 6-2
- Video - "More Bloody Meetings" ......................... 6-7
- Accountability and Responsibility .................... 6-8
- Requests and Promises ................................. 6-10
- Action Plan ............................................. 6-12
- Tasks or People Skills ................................. 6-15
- Management Presentations ......................... 6-19
- Recognition ............................................ 6-23
- How Adults Learn ..................................... 6-26
- Team Member Training ................................. 6-30

GROUP DYNAMICS

- Team Member Expectations ............................ 7-2
- Consensus .............................................. 7-4
- Video - "The Abilene Paradox" ....................... 7-6
- Communication Skills ................................. 7-8
- Stages of Group Development ..................... 7-20
- Coaching .............................................. 7-29
- Conflict Management ................................. 7-37
- Problem Behaviors ................................... 7-45
UNIT 1

Total Quality Management
Overview
To introduce you to the concept of quality and the principles and key concepts of Total Quality Management (TQM).

AGENDA

- Understand the definition of Quality.
- Understand the meaning of Total Quality Management.
- Identify the Four Fundamental Principles of TQM.
- Understand the meaning of Customer Satisfaction.
- Understand the importance of Quality Indicators.
- Identify the Three Major Components of the TQM System.
QUALITY  Quality is meeting the needs of customers and other stakeholders through the provision of products, services and the consequences of operation.

TOTAL QUALITY MANAGEMENT  Total Quality Management (TQM) is the systematic achievement of customer and stakeholder satisfaction through the coordinated actions of all employees and departments in an organization.

Organizations are composed of people making contributions as individuals and groups, or departments. Although many employees never interact with external customers, their activities support the needs of "the next in line" or internal customers.

However, all activities should ultimately be driven from the needs of external customers and other stakeholders. For example, the external customer may interact primarily with a case worker from your Organization. But Program Development made sure the case worker had the proper services available to offer. The interviewer had to ensure the customers' needs were incorporated into the service plan, but had to rely on the Customer Research, the Program Development, and the case worker organizations to accomplish this. The organization is essentially a chain of internal customers and suppliers meeting each other's needs to ensure the needs of external customers and stakeholders are met.
Only by understanding the needs of the external customer and stakeholder and ensuring that those needs are addressed consistently through the Organizational processes by all employees, can Total Quality Management be practiced.
The Total Quality Management System is dependent upon four fundamental principles which must become a part of our daily routines;

1. **Manage with Facts**
   All employees must base decisions on objective data, not instinct or "gut feel". Also, managers must ensure that a disciplined system is in place to manage with facts.

2. **P-D-C-A (Plan-Do-Check-Act)**
   The continuous improvement cycle consists of four stages;
   - **Plan** what to do, and how to do it,
   - **Do** it,
   - **Check** what you did,
   - **Act** to provide feedback, standardize, or apply lessons learned.

3. **Respect People**
   Everyone must listen to all ideas and promote the creativity, self-motivation, and limitless potential of others. Treat others as you would like to be treated. Think and act as a team player. If the teams wins - the individual wins.

4. **Focus on Customers**
   Not only must we satisfy the needs and expectations of customers, we should strive to anticipate those needs. The pervading attitude must be that the **customer and other stakeholders come first**.

If we fail to adhere to any of the four fundamental principles - we cannot hope to continuously improve and succeed in the long run.
MANAGE WITH FACTS

To **Manage with Facts** means **making the best possible decisions** regarding the delivery of quality services to our customers **through the use of objective data**. Properly organized and analyzed data should serve as the basis for decision making and action.

Data enable us to:

- quantify the present situation (baseline).
- track a process.
- establish the gap between **what is** and **what should be**.
- verify the root causes of a problem, or the results of countermeasures.

**Data** - Webster defines data as "facts or figures from which conclusions can be drawn; a basis for reasoning, discussion or calculation."

There are two broad categories of numerical data: **attributes** and **variables**. Understanding the type of data we have helps us to use the appropriate tool to analyze and display the data.

1. **Attributes Data** - represent **countable** occurrences, usually conformity or non-conformity (go/no-go) to some quality characteristic (e.g., number of defects, number or proportion of non-conforming items, services by categories).
2. **Variables Data** - are **measurable** data. The measurement would most likely be of a particular quality characteristic such as diameter, weight, timeliness, flow rate, or age of a product. This type of data is usually more difficult to obtain, but generally provides more information than attributes data. Collecting variables data will help you measure the **degree** of customer satisfaction. Attributes data will only tell you **whether or not** customers are satisfied.
P-D-C-A

P-D-C-A is a cycle based upon the premise that to always meet customer needs, you must continuously improve. You must plan it, do (or implement) it, check the results of your actions and act upon the findings, applying lessons learned to future activities.

The Shewhart Cycle is often used to represent the P-D-C-A cycle.

P-D-C-A is a concept that can be applied to any process, from getting to work each day to managing technical operations. It is also the underlying concept of the Quality Improvement and Control Story.
The application of the Respect People philosophy means respecting other peoples' ideas, their desire for personal development and recognition, and their capacity for self-motivation. It is critical that all levels of the organization live and apply this principle in every interpersonal aspect of daily work. This principle is fundamental to the concept of empowerment.

**Rules of Conduct** - One practical way to reinforce the principle of Respect People is to establish and follow Rules of Conduct during meetings. Your team can either adopt the Rules of Conduct, shown below, or modify them to best suit your team's needs.

<table>
<thead>
<tr>
<th>RULES OF CONDUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Respect others</td>
</tr>
<tr>
<td>• Keep an open mind</td>
</tr>
<tr>
<td>• Listen without interrupting</td>
</tr>
<tr>
<td>• Share the load</td>
</tr>
<tr>
<td>• Constructively criticize ideas, not people</td>
</tr>
<tr>
<td>• Question and participate</td>
</tr>
<tr>
<td>• Attend all meetings</td>
</tr>
<tr>
<td>• Follow the P.A.L. *</td>
</tr>
</tbody>
</table>

With the ground rules established, the team can begin the continuous improvement cycle, P-D-C-A, but meetings must be effectively managed to ensure progress and success.

*See Unit 1, Page 9 for an explanation of P.A.L.*
Managing Meetings - Each Performance Improvement Team's meeting will have an **objective** and an **output** based on the steps and checkpoints of the **QIC Story**. To help complete the necessary output of each meeting, the team leader will complete an agenda. Taking time to plan meetings in advance will help keep the team on track.

**P.A.L.** - Following are three key points to remember when planning a successful meeting:
1. **P** - Have a PURPOSE.
2. **A** - Develop an AGENDA.
3. **L** - Set LIMITS, especially time limits.

**PURPOSE**

Be clear about why the meeting is being held and what is to be accomplished. Never have a meeting for which you have not prepared and which does not have a purpose. Never have a meeting "just to have a meeting".

**AGENDA**

Always have an agenda developed in as much detail as is necessary to keep you and the team on track.
Set a date and place for all meetings but, above all, set a meeting length time limit (for example, one hour). Start on time and BEGIN STOPPING the meeting at least five minutes before the time limit is up. Starting on time and ending on time is a golden rule of meeting management.

If you remember and apply these three simple rules, you will be practicing a simple, but also very powerful leadership behavior.

Each meeting should be critiqued (P-D-C-A) to promote a better meeting next time. The last five or ten minutes of a meeting is a good time to summarize future action items and discuss with other team members, "what went well and what could we have done differently"?

Finally, it is important that the meeting be documented. Meeting minutes* are an effective way to summarize the key points of any meeting. Minutes should be concise and distributed to attendees and other key personnel as soon after the meeting as possible.

*See page 9-7 for a sample minute-taking format.
FOCUS ON CUSTOMERS

Customer satisfaction is the basis for TQM. Everyone in an organization ultimately serves the external customer. But all of us also have internal customers. Everyone who uses our products or services is our customer.

The Customer/Supplier Model helps us understand the interdependencies between our customers, our suppliers and us.

1. Identify your work processes, including inputs, operations and outputs.
2. Identify the customers for your processes. (Who receives your output?)
3. Determine with your customers their needs and expectations for your product or service.
4. Develop indicators to measure your performance against your customers' requirements.
5. Analyze the gap between actual performance and target.
6. Take action to improve.
7. Identify the suppliers for your processes.
8. Inform your supplier of your customer driven requirements.
10. Provide feedback to your supplier.

**PHILOSOPHY OF CUSTOMER SATISFACTION**

- We plan to have long-term customer and supplier relationships.
- We must help our customers identify their needs.
- We must realize that these needs will change.
- We must satisfy the needs of our customers.
- We must keep communication lines open at all times with our customers.
- We must inform our suppliers of our needs and ensure they are clearly understood.
- We must ensure our suppliers become capable of meeting our needs.
- We must keep communication lines open at all times with our suppliers.
Identifying Customers - A customer is typically thought of as the consumer or end user when, in fact, the customer is actually the person or group that receives the output (product or service) of our process.

External customers are those end users whose needs should be met by our product or service. To satisfy external customers, we must also meet the needs of our internal customers - those within our organization who add value to the product or service we provide. Our product may pass through the hands of both primary (next in line) and secondary (following) internal customers before ultimately being received by the external customer.
Customer Needs

To ensure continuous customer satisfaction, we must meet the needs of the customer. This can only be done if we have a clear understanding of those needs. Once the needs are understood, they must be defined and measured from the customers' perspective, not our own.

Measuring the need from the customer's viewpoint can be a painful experience for many organizations. Information systems are often not in place to know how we're doing in meeting customer needs. For example, customers may have a need for "on-time delivery" of your service. Your customer considers a service delivered on time if it is received on the date delivery was originally requested. Your organization, however, may measure "on-time delivery" based on when it promised to be delivered. One can quickly see that there may be conflict and differences of opinion between your customer and the organization regarding your actual delivery performance.

The four principles are critical to the success of any organization. By focusing on the needs of our customers, and engaging and empowering people to make recommendations and decisions based on facts, we can continuously improve all operations for the benefit of our customers, employees and other stakeholders.
Indicators - Indicators, or metrics, are measures of how well we are meeting our customers' needs and are measures of conformance to requirements. Focus on non-conformance, or the pain to the customer, will aid in our improvement efforts. Some examples of indicators are as follows:

- Number of invoices sent containing errors.
- Percent of services provided later than customer requested delivery date.
- Number of lost phone calls.
- Percent of hours of system-down time per month.
- Number of lost time injuries per 100 employees.
- Food stamp error rate

The Purpose of An Indicator - Indicators help us to measure the gap between what is and what should be, or actual performance versus the customer's requirements. Unless we can measure our conformance to the customer's requirements, we will not be able to determine if our improvement efforts have been effective. Indicators help us see the customer's level of pain, guide our improvement activities, and determine the effectiveness of our efforts. By developing appropriate indicators for all of our customers' requirements we will always know how well we are doing in satisfying our customers. By properly managing and continuously improving our performance against all the customer oriented indicators we can actually prevent customer dissatisfaction.
There are three major components to TQM, shown in the TQM Triangle; **Policy Management**, **Performance Improvement**, and **Process Management**. If our goal is to continuously improve customer satisfaction, these structures must be in place and supported by the four fundamental principles.
1. **Policy Management** - Policy Management is the identification, and verification of priority organization issues and the deployment of activities to achieve breakthrough performance improvement in a few selected areas (i.e., "Do the right things").
   - Determine Organization vision and direction.
   - Identify external customers and other stakeholders' needs.
   - Determine critical organizational issues.
   - Target areas for breakthrough performance improvement.
   - Communicate organization direction, goals, and objectives.
   - Translate goals into specific activities.
   - Attain organization-wide participation in the achievement of organizational goals and objectives.
   - Continuously review progress toward the goals and objectives.
   - Provide feedback.
   - Standardize systems.

2. **Performance Improvement** - Performance Improvement is the purposeful attainment of customer or organizational requirements from a state of non-conformance. Emphasis in TQM is placed on continuous performance improvement through structures that enable and promote team and individual contributions (i.e., "Do things right the first time").
   - Continuously improve to meet the changing needs of customers.
   - Develop and effectively utilize the skills and abilities of all employees at all levels.
• Promote the use of a common language to facilitate analysis and communication.
• Encourage employee involvement through teamwork and individual contributions.
• Strive for balance between assigned and voluntary team efforts.
• Review progress and provide feedback.
• Maintain the gains and share with others.
• Apply lessons learned to future activities.

3. **Process Management** - Process Management is the mechanism that supports the Plan-Do-Check-Act (PDCA) cycle. Once incremental improvement is achieved, the process must be controlled or managed (i.e., "Keep things right").
   • Maintain the gains achieved through team or individual improvement projects.
   • Achieve consistency in operations.
   • Improve and manage daily work processes.
   • Provide the foundation for continuous improvement and the efficient allocation of resources.

Organizations that learn to apply all three components of TQM can achieve world class performance. By meeting the needs of customers and other stakeholders by effectively utilizing their people and resources, organizations can win for employees and other stakeholders.
In summary, Total Quality Management is a system that is designed to achieve customer satisfaction through the combined efforts of the entire organization. Organizations are composed of people. Therefore, an effective TQM system balances the needs of the organization and its employees.

The four fundamental principles serve as cornerstones providing balance to the management system. Focus on your customer, manage with facts, respect each other and think as a team, and P-D-C-A. These principles will help you master your environment, put you on the path of continuous improvement and enable you to achieve a world-class performance in all endeavors.

The remainder of this manual will focus on the **Performance Improvement** component of the TQM triangle and supporting statistical tools and techniques.
UNIT 2

Teams and Roles
UNIT 2

Teams and Roles

2-1

PURPOSE

To help you understand the different types of teams and the key positions in the Total Quality Management System.

AGENDA

- Describe the Role of Teams in TQM.
- Identify the Types of Teams and Their Purposes.
- Understand the Roles of Key Positions in TQM.
Performance Improvement Teams

Performance Improvement Teams are critical to the TQM System. The ideal team size is four to eight members. Four members helps ensure enough different viewpoints to provide a balanced approach to the problem. No more than eight members helps enable the new Team Leader to better guide the team through the natural stages of group development toward prompt and effective problem resolution. There are two major types of problem solving teams, either of which can be cross-functional (cutting across organizational boundaries).

1. **Voluntary Team** - On-going, chooses its own problem or improvement opportunity. These teams usually consist of employees that work in a common work group, area or department.

2. **Task or Assigned Team** - Non-voluntary, usually disbands upon completion of its mission, addresses problems and issues assigned by management. The employees are brought together to apply unique skills or knowledge to a common opportunity or problem.
Lead Teams

A third type of team, called a Lead Team, sets directions and guidelines, and reviews the progress of Performance Improvement Teams. Lead Teams may exist at any level, for example:

- Agency **Lead Team** (may also be called a Quality Council).
- District / Program Office **Lead Team**.
- Division / Program **Lead Team**.

**Lead Teams** typically establish goals, assign issues, review progress and make decisions. Their primary purpose is not to solve problems.
KEY POSITIONS

A **Team Member** is a person participating on a Performance Improvement Team.

The team member is vital to the success of TQM. Without the input of the team member to identify and solve the day-to-day problems, the TQM system cannot succeed.

Team members are expected to:

- Attend all team meetings.
- Share experiences and knowledge.
- Identify improvement opportunities.
- Participate in the decision of which problems to address.
- Gather and analyze data.
- Help the team recommend countermeasures to management.
- Track the effectiveness of countermeasures.

Team members are expected to actively participate in all team activities. This may require more time than one hour a week for a team meeting. Meetings may be spent on whatever activities the team feels are most appropriate at that time.
A **Team Leader** is a team member who receives special training to equip her/him for the additional responsibilities of leadership.

Team Leader responsibilities include:

- Lead the team meetings.
- Lead the team through the Quality Improvement and Control Story.
- Teach and refresh the team on pertinent tools and techniques.
- Communicate team progress to the team.
  - Monitor team involvement and enthusiasm,
  - Evaluate and manage group dynamics to maintain team effectiveness.
- Communicate and coordinate with the supervisor and/or the facilitator, especially before and after team meetings.
- Share experience and knowledge.
- Fulfill administrative duties.

The Team Leader should be proficient at delegating through encouraged participation, involving all team members. They **can not** and **should not** be expected to do everything. The effective team has shared leadership.

The effective team leader balances tasks with concern for people.
The **Facilitator's** basic function is to be the "cultural change agent". As a consultant to the team leader, the facilitator is expected to run interference and clear the way for the team.

The successful facilitator must fulfill at least five key roles;

1. **Coach** - Serve as a support and resource person. Recommend support staff or specialists when needed. Provide encouragement and feedback to the team leader.

2. **Communicator** - Keep teams and management aware of team successes, lessons learned, and emerging issues important to the Organization and its employees.

3. **Coordinator** - Support and involve supervision and provide links to other departments. Help secure support staff or specialists when needed. Assist the team leader in meeting preparation (P.A.L.'s, etc.).

4. **Promoter** - Actively promote team activities such as **QIC Story** reviews, recognition events and awards.

5. **Teacher** - Instruct in the **QIC Story**, tools and techniques. Critique the team leader's effectiveness after the meeting adjourns and suggest possible group dynamics management techniques. Support team leaders, when necessary, in providing initial or refresher training to team members.
The **Supervisor** can assist the team in many ways. Primarily, it is the supervisor's responsibility to ensure that team members have the time and resources needed for success. The supervisor should serve as an advisor without dictating team activities.

Five critical activities performed by the supervisor include:

1. **Assist in Implementation of Countermeasures.** Implementing change can be difficult. The supervisor should assist the team by making sure they have been thorough and by becoming a resource whenever needed.

2. **Coach.** The supervisor should act as a technical problem-solving resource, encouraging teams to keep going when barriers are encountered.

3. **Coordinate Team Activities.** The supervisor can take an active role in communicating to the team the problems relating to department objectives. Suggestions can be given on possible problems to select and how to schedule, track, and measure progress toward solutions. The supervisor should ensure that the team has adequate leadership and facilitation, and that training is provided to all leaders, members and facilitators.
4. **Provide Resources.** The supervisor should make sure that the team has the training, time, place, technical resources and any other materials necessary for effective meetings.

5. **Recognize Team Achievement.** Praise, support and feedback to teams are constant duties of the supervisor. Management support at all levels is vital to the success of the TQM processes.
The Quality Improvement and Control Story

Quality Improvement And Control Story Process

Team Information

1. Reason For Improvement

2. Current Situation

3. Analysis

4. Countermeasures

5. Results

6. Standardization

7. Future Plans

Legend:

- P.S. - Problem Statement
- P.R.C. - Probable Root Cause
- V.R.C. - Verified Root Cause
- C.M. - Countermeasures
- P.M. - Practical Method
- E.F.F. - Effectiveness
- FEAS. - Feasibility
- C.L. - Center Line
- LCL - Lower Control Limit
- UCL - Upper Control Limit

Copyright 1997 CTI. All Rights Reserved. QICStory is a registered trademark of CTI, Inc.
The purpose of this unit is to introduce you to the Quality Improvement and Control (QIC) Story, its seven steps and 25 checkpoints.

Discuss the Two Primary Purposes of the QIC Story.

Understand the Seven Steps of the QIC Story, the Objectives of Each Step and the 25 Checkpoints.

Learn the importance of data and indicators to understand and measure the stakeholder's needs, analyze the problem and determine the effects of countermeasures.

Explain the importance of the QIC Story as a standard way to communicate progress and recommendations toward improved performance.
Introduction
Successful organizations are able to effectively utilize their people to address and prevent problems. In today's competitive environment, time is a key factor of success. Facts must be gathered, effectively analyzed and conclusions drawn. A logical, analytical approach that ensures consistency and decisions based on facts can be a powerful tool.

Where people are involved, clear and concise communication is critical to facilitate quick decisions. We all remember the adage, "a picture is worth a thousand words". It has also been proven that adults more quickly grasp, and retain for a longer period of time, information presented in pictures, charts and graphs.

The Quality Improvement and Control Story
The Quality Improvement and Control Story is a logical and simple approach to solving problems, regardless of complexity or scope. It provides the framework for analytical consistency throughout the organization and a standard way of communicating team or individual progress and recommendations.

It helps the team members to collect, organize, and analyze information and to monitor how they are doing.
It communicates team progress to management.
It communicates information to non-team members, and can solicit non-team member feedback.
It documents the organization's record of continuous improvement.
The **QIC Story** serves as a guide for the P-D-C-A cycle (see below), and provides a clear picture of the process used to improve performance.

<table>
<thead>
<tr>
<th>THE QIC STORY PROCESS AND P-D-C-A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP 1.</strong> REASON FOR IMPROVEMENT</td>
</tr>
<tr>
<td><strong>STEP 2.</strong> CURRENT SITUATION</td>
</tr>
<tr>
<td><strong>STEP 3.</strong> ANALYSIS</td>
</tr>
<tr>
<td>• IDENTIFY POTENTIAL ROOT CAUSES</td>
</tr>
<tr>
<td>• VERIFY ROOT CAUSES WITH DATA</td>
</tr>
<tr>
<td><strong>STEP 4.</strong> COUNTERMEASURES</td>
</tr>
<tr>
<td>• DEVELOP</td>
</tr>
<tr>
<td>• IMPLEMENT</td>
</tr>
<tr>
<td><strong>STEP 5.</strong> RESULTS</td>
</tr>
<tr>
<td><strong>STEP 6.</strong> STANDARDIZATION</td>
</tr>
<tr>
<td><strong>STEP 7.</strong> FUTURE PLANS</td>
</tr>
</tbody>
</table>

The **QIC Story** was designed to effectively guide you to a logical problem resolution, set the stage for continuous improvement, and enable you to communicate your approach to others to facilitate quick understanding and decisions. The **QIC Story** process differs from other problem solving methodologies because it combines problem solving with a communication tool called a storyboard. It is the effective application of graphical QC Tools presented in a clear, logical and concise manner that "tells" the story.
The **Storyboard** is used by the team to help track and communicate the team's progress and successes in applying the Quality Improvement and Control Story process. It is useful to display it in the work area as the team progresses through the problem or opportunity. This enables others in the work area to contribute ideas to the team. At the end of the project the storyboard gives a clear picture of the team's accomplishment.

### QUALITY IMPROVEMENT AND CONTROL STORY PROCESS

<table>
<thead>
<tr>
<th>TEAM INFORMATION</th>
<th>REASON FOR IMPROVEMENT</th>
<th>CURRENT SITUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPROVEMENT SCHEDULE</td>
<td>BAR CHART</td>
<td>PARETO CHART</td>
</tr>
<tr>
<td>UNITS</td>
<td>TYPE</td>
<td>GOOD</td>
</tr>
<tr>
<td>PIE CHART</td>
<td>RATE</td>
<td>GAP</td>
</tr>
<tr>
<td>LINE GRAPH</td>
<td>TIME</td>
<td>PROBLEM</td>
</tr>
</tbody>
</table>

#### ANALYSIS

**IDENTIFY**

**VERIFY**

**HISTOGRAM**

**SCATTER DIAGRAM**

#### COUNTERMEASURES

**COUNTERMEASURES MATRIX**

**ACTION PLAN**

#### RESULTS

**CONFIRMATION**

**INDICATOR**

**OVERALL EFFECT**

#### STANDARDIZATION

**PROCESS MANAGEMENT SYSTEM**

**INDICATORS**

**LESSONS LEARNED**

#### FUTURE PLANS

**AP**

**CD**

---

**LEGEND:**

- P.S. - PROBLEM STATEMENT
- P.R.C. - PROBLEM ROOT CAUSE
- V.R.C. - VERIFIED ROOT CAUSE
- C.M. - COUNTERMEASURES
- P.M. - PRACTICAL METHOD
- EFF. - EFFECTIVENESS
- FEAS. - FEASIBILITY
- CL - CENTER LINE
- LCL - LOWER CONTROL LIMIT
- UCL - UPPER CONTROL LIMIT
OBJECTIVE:

Demonstrate the importance of improvement needs in measurable terms.

DESCRIPTION:

STEP 1 demonstrates with data, why this particular improvement need is more important than any other. To accomplish this, we must identify the stakeholders and their needs. We must also measure our performance in meeting those needs. This will enable us to better prioritize improvement opportunities and develop a theme statement to focus our efforts. Finally, we must establish a preliminary schedule for conducting our improvement activities.

CHECKPOINTS:

1. The stakeholder and need were identified.

Performance improvement needs may be identified from many sources, including:

   External or internal customer surveys, reports or discussions,
   Department or organization indicators,
   Management requests, and
   Employee information and ideas.

It should be clear as to who the stakeholder is, what is the need for improvement, and why improvement is important to this particular stakeholder.
An indicator measuring our performance in meeting the need was developed.
An indicator should graphically demonstrate the stakeholder's measured need and our need to improve. Facts and data enable us to measure our performance. Measurement enables us to prioritize. Prioritization enables us to allocate scarce resources.

A theme statement consistent with the indicator was selected.
A clear and concise theme statement represents the purpose of the performance improvement activity. There should be clear linkage between the theme statement and the indicator established in checkpoint #2.

A schedule for completing the seven improvement steps was developed.
A schedule represents a commitment by both the team and management to improve performance within a specified period of time. To meet this objective, the team members must meet regularly, and management must support the team.
TOOLS AND TECHNIQUES:
Commonly used tools may include:
- Checksheet
- Control Chart
- Histogram

Helpful techniques used may include:
- Brainstorming
- Consensus
- Multivoting
- Process Flow Chart

Graphs
- Bar Graph
- Line Graph
- Pie Chart

Project Planning Worksheet
Survey - Interview
Theme Selection Matrix
Theme Statement
OBJECTIVE:

*Investigate the features of the theme, select a problem, and establish a target for improvement.*

DESCRIPTION:

At first glance, STEP 2 may look similar to STEP 1. However, whereas the objective of STEP 1 is to recognize the relative importance of a particular improvement need or theme, the objective of STEP 2 is to discover significant factors or features of the theme and select a specific problem from within it. Therefore, the theme must be stratified from various viewpoints to discover significance. After a specific, significant problem has been identified, a target for improvement based on the stakeholder's need must be established, along with the impact of that target on the theme indicator in STEP 1. Finally, a properly defined problem statement should be written to further focus the team.

CHECKPOINTS:

5. The theme was stratified from various viewpoints and a significant problem was chosen. The best angle from which to stratify an opportunity will differ from case to case. However, in each case stratification should be attempted from at least four important viewpoints to search for significance. Those viewpoints are place, symptom, time, and type. If the final stratification results in a cross-functional opportunity area, the team's membership should be reconsidered to ensure that the appropriate functional groups are represented on the team.
A target for improvement was established based on the stakeholder's need. The stakeholder referred to here is the same as in STEP 1, checkpoint #1, and the need should be determined by questioning the stakeholder if possible, or management rather than by assumption. As in any translation of stakeholder needs and wants to measurable terms, "Win-Win" oriented negotiation may be necessary. Targets may also be established through benchmarking.

The impact of the target on the theme indicator was determined. This checkpoint ensures the logical flow of information or linkage between STEPS 1 and 2. The target is set based on the desired improvement on the problem but a check must be made to ensure that the impact of that improvement on the theme indicator is understood. A statement should be made to indicate the impact meeting the target will have on the theme indicator.

A problem statement that addressed the gap between the actual and target values was developed. The problem statement must be properly defined by answering the questions; who, what, when, where, what is the gap, and what is the pain? The pain can be effectively demonstrated with reference to the theme, or with supplemental quality cost indicators. The answer to the question "why" will be addressed in STEP 3 of the QIC Story process.
TOOLS AND TECHNIQUES:

Commonly used tools may include:

- Checksheet
- Graphs
  - Bar Graph
  - Line Graph
  - Pie Chart
- Histogram
- Pareto Chart

Helpful Techniques used may include:

- Problem Statement
- Process Flow Chart
OBJECTIVE:

*Analyze the problem to identify and verify its primary root causes.*

DESCRIPTION:

STEP 3 identifies the problem's primary causes and verifies them with data to ensure they are the **root** causes. To accomplish this task, first collect as much information as possible concerning the problem and identify its **potential** causes. Take each potential cause to the **root level** and check reverse logic. Next, **select** the **most likely** primary causes - those which potentially have the greatest impact on the problem. **Verify** a **cause and effect** relationship between the most likely causes and the problem. It is important to conduct sufficient analysis so that each primary root cause's **impact** on the gap identified in STEP 2 can be approximated. Analysis should be sufficient to satisfy the reasonable person.

CHECKPOINTS:

9  **Cause and effect analysis was taken to the root level.**

Cause and effect analysis requires that sufficient knowledge concerning the problem is collected. This may require subject matter experts or people from other departments. Thorough brainstorming with this expertise plus asking "why" numerous times can help the team get to the root level.
Potential causes most likely to have the greatest impact on the problem were selected.

Appropriate expertise and effective use of list reduction techniques such as the Delphi, Multivoting or Nominal Group techniques can help the team select the "most likely" root causes for further evaluation.

A relationship between the root causes and the problem was verified with data.

Verification must be performed with data. Careful thought should be given as to what relationship is to be proven so that an appropriate data collection form can be designed. The team must determine if the data to be collected will be attributes or variables and how long it will take to collect data. Verification of root causes should be sufficient to satisfy a reasonable person.

The impact of each root cause on the gap was determined.

Sufficiently collected and analyzed data will enable the team to approximate with confidence the impact of root causes on the gap. This is a step critical to cost-benefit analysis which will be done in STEP 4 when feasibility is evaluated.
TOOLS AND TECHNIQUES:

Commonly used tools may include:

- Cause and Effect Diagram
- Checksheet
- Histogram
- Pareto Chart
- Scatter Diagram

Helpful techniques used may include:

- Brainstorming
- Delphi Technique
- Multivoting
- Nominal Group Technique
OBJECTIVE:

*Develop and implement countermeasures to eliminate the verified root causes of the problem.*

DESCRIPTION:

In STEP 4, countermeasures should be selected that act as immediate remedies to the root causes of the problem and that actually eliminate the root causes. Although immediate remedies are vital, we must always provide for prevention of the recurrence of the root cause of the problem. The countermeasures must not only effectively close the problem gap, but they should be feasible and not cause other problems to occur. The action plan to implement the countermeasures should consider contingencies and include sufficient detail to answer the questions; who, what, when and how?

CHECKPOINTS:

13. Countermeasures were selected to address verified root causes.

A distinction must be made between actions taken to cure the problem (immediate remedy) and those which eliminate the root causes, thus preventing recurrence. In addition, care should be taken to prevent other problems from occurring as countermeasures are implemented. A Countermeasures Matrix may be initiated in this checkpoint.
The method for selecting the appropriate practical methods was clear and considered effectiveness and feasibility.

The practical methods which are being proposed for each countermeasure should be rated as to their effectiveness in closing the problem gap. They should also be rated as to feasibility. The Countermeasures Matrix can then be completed by multiplying the effectiveness and feasibility ratings together. The practical methods with the highest total scores should be considered for implementation. An important factor of feasibility is cost-benefit. Cost effectiveness should be investigated using a Cost-Benefit Analysis of appropriate detail.

Barriers and aids were determined for countermeasures worth implementing.

Existing forces pushing for (aids) and against (barriers) the establishment and implementation of the practical methods should be assessed. This will help in the development of contingencies and ensure the action plan is realistic.

The action plan reflected accountability and schedule.

The action plan needs to be as specific, realistic, and as thorough as possible. Individual names should appear in the action plan instead of departments or groups whenever possible. This will enhance accountability and the probability of success. The schedule should coincide with any date established for achieving the target in STEP 2.
TOOLS AND TECHNIQUES:

Helpful techniques used may include:

- Action Plan
- Barriers and Aids
- Countermeasures Matrix
- Cost-Benefit Analysis
OBJECTIVE:

Confirm that the countermeasures taken impacted the root causes, the problem, and the theme.

DESCRIPTION:

In this step, demonstrate the effects that selected countermeasures had on the stakeholder's need. An effective way to demonstrate the effects is through a series of before and after indicators. First in the series are comparisons to the root cause indicator in STEP 3. Next, a comparison is made to the indicator, and target, in STEP 2 that represents the problem. Causes of significant variation from the target should be understood and addressed. Finally, a comparison to the theme indicator in STEP 1 demonstrates the effect of the improvement on the stakeholder's need.

CHECKPOINTS:

17 The effect of countermeasures on the root causes was demonstrated.

Appropriate use of statistical tools is an effective way to show the impact of countermeasures on root causes identified in Step 3. This type of before and after comparison using statistical tools leaves little doubt as to the effectiveness of the countermeasures and resources expended.
The effect of countermeasures on the problem was demonstrated. Appropriate use of the statistical tools is an effective way to show the impact of countermeasures on the problem identified in Step 2.

By reducing the problem, the overall improvement need (Step 1) is also addressed.
The improvement target was achieved and causes of significant variation were addressed.

If there is a significant difference between the target and the achievement, the team should understand and explain why those effects have occurred.
The effect of countermeasures on the theme indicator representing the stakeholder's need was demonstrated.

In STEP 1 an indicator was used to represent the stakeholder's need. The team should now show the effect of their countermeasures on that need.

This procedure "closes the loop" on the team's improvement efforts and demonstrates its contribution to the stakeholder's need.

**TOOLS AND TECHNIQUES:**

Commonly used tools may include:

- Checksheet
- Control Chart
- Histogram
- Pareto Chart

Graphs
- Bar Graph
- Line Graph
- Pie Chart
UNIT 3

Step 6 - Standardization

3-21

OBJECTIVE:

_Maintain and share the gains._

DESCRIPTION:

In STEP 6, the successful countermeasures should be documented and integrated into the appropriate process, procedure or standard. Those changes must be communicated and the necessary education and training must occur. In addition, a system of responsibility should be established to ensure that the revised process or procedure is observed. If the above steps are not taken, the countermeasures taken will gradually revert to the old methods and the problem will return. In addition, without a revised process or new standards, the problem will likely return when new employees become involved in the work. By considering specific areas for replication, we enable the organization to leverage scarce resources and minimize duplication of effort.

CHECKPOINTS:

21. A method was established to document, permanently change, and communicate the revised process or standard.

When revising the process or standard, the five "W's" and one "H" should be answered and communicated. The method of executing the job can be well understood without the "why", but the "why" is vital to the person doing the job. Without the "why", the revised process may
never be followed or later improved. In addition, training and education is necessary to make the revisions stick and become part of the daily routine.

Responsibility was assigned and periodic checks scheduled to ensure compliance with the revised process or standard.

As in anything that is important in business, someone must be accountable and responsible for compliance. Regular reviews or monitoring must occur for consistent results.

Specific areas for replication were identified.

The team members are responsible for identifying potential replication areas for management to consider. Replication, which is the imitation of the standard in other areas to prevent root causes, is a resource leveraging process that is vital to receive the full benefits of the QIC Story process. Replication can prevent duplication of effort and minimize costs. Management must promote replication.
TOOLS AND TECHNIQUES:

Commonly used tools may include:

- Control Chart
- Graphs
  - Bar Graph
  - Line Graph
  - Pie Chart

Helpful techniques used may include:

- Action Plan
- Process Flow Chart
UNIT 3

Step 7 - Future Plans

OBJECTIVE:

Evaluate the team's effectiveness and plan future activities.

DESCRIPTION:

Once the Quality Improvement and Control Story is completed, an assessment must be made as to how thoroughly the theme indicator has been improved and whether or not it would be effective to continue working on the theme through another QIC Story. In addition to assessing additional work on the theme, some time should be spent discussing and documenting the lessons the team members learned and the team members' collective personal growth. Finally, specific plans for continuous improvement, or P-D-C-A, should be made.

CHECKPOINTS:

24 Any remaining problems of the theme were addressed.

Determine, by using the (AFTER) Pareto Chart of the problem, the recent improvement of the theme indicator, or a cost-benefit analysis, whether it is desirable to further address the theme through additional QIC Story applications.
Lessons learned, P-D-C-A of the QIC Story process, and team growth were assessed and documented. Some reflective thoughts should be given to the team's actual problem solving activities. Consider what went well and what could be done differently next time. This should aid in the solving of future problems (P-D-C-A). The team may wish to document and display team growth.

TOOLS AND TECHNIQUES:
Helpful techniques used may include:

- Action Plan
- Radar Chart (or Spider Diagram)

Continuous performance improvement comes with each "turn of the wheel". Each turn begins at a higher performance level than the previous turn.
UNIT 4
The Seven Basic Quality Control Tools

1. CAUSE AND EFFECT DIAGRAM
2. CHECKSHEET
3. CONTROL CHART
4. BAR GRAPH
5. HISTOGRAM
6. PARETO CHART
7. SCATTER DIAGRAM
UNIT 4
The Seven Basic Q.C. Tools

PURPOSE

The purpose of this unit is to introduce you to the seven basic Quality Control (QC) tools and their use in the QIC Story.

AGENDA

- Discuss the usefulness of the QC Tools.
- Discuss the purpose of the Data Source Block.
- Review the Application of the QC Tools in detail.
A vital part of the **QIC Story** process is the use of statistical quality control (QC) tools. The QC tools graphically convey analyzed data. It's the combination of the tools and the **QIC Story** steps that "tells the story".

**WHAT ARE THE SEVEN BASIC Q.C. TOOLS?**
The Seven Basic QC Tools are common analytical methods used to solve problems. They are: Cause and Effect Diagram, Checksheet, Control Chart, Graphs, Histogram, Pareto Chart and Scatter Diagram.

**WHY ARE THE SEVEN BASIC Q.C. TOOLS USEFUL?**
The major use of QC tools is to provide objectivity and clarity in understanding and communicating information. They help separate the subjective from the objective, thereby allowing us to "manage and speak with facts". They can be used by individuals and teams to examine and improve both work processes and results.
SOURCE BLOCK

A data source block enables the reviewer to quickly determine the following information from any chart, diagram or graph:

- **When** - The date the data were collected or the date of the report from which the data came.
- **Where** - The source of the data such as data base, department or file name.
- **Who** - The name and phone number of the person who summarized the data and created the chart.

Remember, all charts and graphs should be complete, self explanatory and "stand on their own".
When using any of the Seven Basic QC Tools, the data source should be identified. One standard means of accomplishing this is shown below.

**SOURCE BLOCK**

<table>
<thead>
<tr>
<th>DATA SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>When:</td>
</tr>
<tr>
<td>Where:</td>
</tr>
<tr>
<td>Who:</td>
</tr>
</tbody>
</table>
A **CAUSE AND EFFECT** Diagram is used to determine the relationship between the "effect" (or problem) and all the possible "causes" influencing it. Cause and Effect Diagrams are drawn to clearly illustrate the various causes (generated by the group in a brainstorming session) that affect a process, or outcome. For every effect there are likely to be several major categories of causes. Usually the categories can be summarized under general headings such as Environment, Equipment, Materials, Methods, and People but may vary according to the area of improvement the group is working on. From this well defined list of possible causes, the "most likely" are identified and selected for further analysis with data. The Cause and Effect Diagram, when finished, will take on the shape of fishbones, hence the nickname "fishbone" diagram.

**EXAMPLE:**

![Cause and Effect Diagram Example](image-url)
PROCEDURE:

1. Draw the Cause and Effect Diagram with the effect, or problem (box) on the right and the major bones to the left.

2. Write the problem statement in the head of the diagram (only the quality characteristic or effect is necessary).

3. Determine as many causes considered to link to the effect as possible. Brainstorming is most effective for accomplishing this purpose. It is important to involve as many people as possible who have practical knowledge of the problem in this discussion. The team should consider the following:

   • What might be causing variation in your quality characteristic (effect)? A variation in the effect must be caused by variation in the factors (causes).

   • Consider only one specific, measurable effect at a time. If the problem statement was properly created this will already be done. The diagram becomes too complicated and not as effective if more than one effect, or too broad a problem, is involved.

   • Causes should be measurable. If they are not, try to discover a way to measure them.

   • Causes must be actionable. If the cause identified cannot be acted upon, the problem will not be solved.

   • Analyze the steps of the process under investigation to search for causes.
4. Identify the primary causes or major categories as the big bones by grouping the brainstormed causes in #3 and determining an appropriate title for each group. Place a title in each of the rectangles using the generic categories of Environment, Equipment, Materials, Methods, and People and then brainstorm each of those. Some variation on these categories pertinent to your situation, or the major work process steps are other ways of selecting major categories for the rectangles.

5. Once the diagram is set up with major categories, transfer the causes in #3 to it. Begin with the major category the team has identified as most likely to produce the actionable root cause (the category aligned most closely to the effect) and ask "why?", sometimes up to five times per logic chain. Why does this occur? Why does this condition exist?

Be sure to "walk" through the logic of your diagram in both directions, as shown below (This \textbf{a1} is caused by this \textbf{a2}, which is caused by this \textbf{a3} which is caused by this \textbf{a4}). Then, in reverse, \textbf{a4} caused \textbf{a3}, \textbf{a3} caused \textbf{a2}, which caused \textbf{a1}. Often illogic will not surface until the second direction is tried. This completes one logic chain.
Now revisit each sub-bone for additional causes; specifically, move back to a2 and ask again, "Why does a2 occur?" Next, ask again "Why does a1 occur?" and continue this process of asking "why?" back to the major bone. This process is critical to identifying actionable potential root causes.

6. Indicate, by "clouding" or highlighting in some way, the most likely root cause(s) (see below).

Completion of the Cause and Effect Diagram will provide the team with its most likely root cause(s). We must now verify that a change in our potential root cause results in a change to our quality characteristic (effect). Once we verify this relationship with data, we can proceed to Countermeasures, Step 4.

The Pareto Chart by causes, or a Scatter Diagram, can be particularly useful in verifying a root cause. After the Cause and Effect analysis, collect data on the problem and categorize by causes on a Pareto Chart. This will show to what extent the potential causes affect the quality characteristic, resulting in non-conformance. The Scatter Diagram can enable us to determine, with varying degrees of confidence, that a cause and effect relationship exists between variables.
A **CHECKSHEET** is a form used to collect data. Checksheets are easy to understand and help translate opinions into "facts". There are many different types of checksheets depending on the type of data and intended use. Each checksheet is custom designed for its special purpose. A thoughtfully developed checksheet permits the review of data from several viewpoints.

**EXAMPLE:**

<table>
<thead>
<tr>
<th>Abuse Reported</th>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type D</td>
<td>P.M. A.M.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type C</td>
<td>P.M. A.M.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type B</td>
<td>P.M. A.M.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type A</td>
<td>P.M. A.M.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Department of Children and Families**

Phone Calls Received on FAHIS by one Representative

Source:
When: 1/97
Where: FL
Who: JCE, x4091

N = 129

**DESIGNING THE CHECKSHEET:**

1. Decide on what data you need, considering also how you might want to stratify the data. Once again, the four "W"s" and the "H" are helpful; **WHO** might be responsible, **WHEN** can it occur, **WHERE** can it happen, **WHAT** components might be involved, **HOW** can it happen?
2. Simplify the form. Design the form to make it very easy for the people who will help gather the data.
   - Make sure the checksheet has places to record all relevant data source information, such as:
     - by whom
     - sample and/or population size
     - location
     - lot or order number
     - service type
     - symbols identified (legend).

3. Design a **worksheet** for individuals to use as they record the data you need. Make the questions straightforward, well organized, and easy to read and interpret (inorganizational visual elements if possible). In a sample, the total population from which the data were collected should also be noted.

4. Plot your form, if possible. Run a small data collection sample with your newly designed form to identify and resolve any unforeseen problems.

5. Design a "tally" sheet to combine the results from the individual forms.

6. Make revisions to the checksheet as needed (especially for long-term data gathering).
COLLECTING DATA:
Collect the data consistently and honestly, making sure there is time allowed for the data gathering task.

Following are some important considerations to help ensure quality data:

1. Train the People.
   - Your analysis will only be as good as the data you collect. Make sure everyone involved is trained on what to do with the form.

2. Ensure Objectivity.
   - Collect the data consistently and honestly - being careful not to introduce bias. If others are collecting the data, this point must be stressed in the training.

3. Allow Time.
   - Make sure sufficient time is allowed to collect the data.

4. Consider Seasonality.
   - Ensure the sample or data selected is drawn from a population or period representative of conditions in which the problem occurred.
CONTROL CHARTS can be classified into two main applications groups depending on the type of data generated from the process. Below is a chart summarizing the types of data and applicable Control Charts that will be discussed on the following pages.

<table>
<thead>
<tr>
<th>Types of Data</th>
<th>Types of Charts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributes Data</td>
<td>p Chart</td>
</tr>
<tr>
<td></td>
<td>np Chart</td>
</tr>
<tr>
<td></td>
<td>c Chart</td>
</tr>
<tr>
<td></td>
<td>u Chart</td>
</tr>
<tr>
<td>Variables Data</td>
<td>$\bar{x}$ - R Chart</td>
</tr>
<tr>
<td></td>
<td>$x$ - Rs Chart</td>
</tr>
</tbody>
</table>

The following is a simple rule of thumb to help you distinguish between the two types of data:

- Attributes Data - Countable (e.g. number of errors, on or off).
- Variables Data - Measurable (e.g. degree of outcome achieved).
ATTRIBUTES DATA CONTROL CHARTS:

• **p Chart:** This is a one-part control chart used to chart a process which generates attribute data. It is applicable to problems which deal with the **percentage or proportion** not conforming to specifications from a sample or population of varying size.

  *Example:* Percentage of invoices reworked per month, or the percentage of services delivered late to customers.

• **np Chart:** This is a special type of **p chart** where the **number** instead of percentage of non-conformances is tracked from a fixed sample size at each observation point.

  *Example:* Number of errors found in an inspection for food stamp eligibility with equal sample size at each inspection.

• **c Chart:** This chart counts the number of defects (non-conformances) in each sample with a **constant sample size**.

  *Example:* Number of omissions found on the district reports to the Central Office (with the number of districts remaining constant).

• **u Chart:** This chart counts the number of defects (non-conformances) per unit with a **varying sample size**.

  *Example:* Number of omissions found per eligibility application (as found from a sample of 10% of all applications received each week).
VARIABLES DATA CONTROL CHARTS:

- **$\bar{x}$-R (X-bar R) Chart:** This is a two-part control chart used to monitor processes with variables data. The number of items observed at each subgroup should be at least two or at most ten.

$$2 \leq n \leq 10$$

(n = number of items)

**Example:** Average time it takes to drive to work per day. Consider a work week of five days as a subgroup.

The $\bar{x}$ chart tracks how the process average varies from one point to another. In the example, this will be how the average drive time varies from week to week. The R (or Range) chart tracks the variation that occurs within each subgroup (the time difference between each daily drive to work).

- **$x-R_s$ Chart:** This chart is similar to the $\bar{x}$-R Chart, but the number of items observed at each subgroup is equal to 1. In other words, the $x-R_s$ Chart tracks how each process data point varies from another.

**Example:** The total overtime hours reported per month for a department.
WHY ARE CONTROL CHARTS USEFUL?

Control Charts are helpful tools to monitor the performance of an ongoing process in determining the following:

1. If the process is in control, or if action needs to be taken to keep the process in control, or if action needs to be taken to bring it back to control.

2. If the process is meeting the customer's needs.

3. If an opportunity for process or system improvement exists.

4. If any countermeasures have improved the process.
PROCEDURE:

1. Collect data.
2. Calculate the average, or mean.
3. Calculate the range, when appropriate.
4. Draw a "mean" or "central" line (CL) that represents the statistically calculated average value of the process.
5. Draw the horizontal and vertical axes and enter an appropriate scale.
6. Draw an upper control limit (UCL) at a calculated distance above the central line which represents the maximum variation that could be expected if only normal/common causes of variation are present.
7. Draw a lower control limit (LCL) at a calculated distance below the central line which represents the minimum variation which could be expected if only normal/common causes of variation are present.
8. Enter data by drawing a point at the measured position over the proper scaled data group in the exact sequence as it was gathered, otherwise it is meaningless.
9. Draw lines connecting the points.
10. Analyze data looking for non-random trends.
HOW TO INTERPRET CONTROL CHARTS:

1. POINT OUTSIDE OF LIMIT:

Control limits are calculated to measure the natural variability of a process. Any point on or outside the limit is considered abnormal, or special, and requires investigation.

2. RUN:

A "run" of seven points on one side of the center line is considered abnormal. Also considered abnormal:

10 out of 11, 12 out of 14, 16 out of 20 points on one side of the center line. Each of these situations requires investigation.

3. TRENDING:

Seven points in a continuous upward or downward direction requires investigation.
4. CYCLING (PERIODICITY):
   Any repeated up and down trend is abnormal and requires investigation.

5. HUGGING (APPROACHING THE CENTER LINE):
   When most points lie close to the center line an uncontrolled state is indicated. This usually means there is a mixing of data from different populations. This makes the control limits too wide and stratification of data is usually necessary.

A NOTE ON SPECIFICATION LIMITS:
Specification limits may be established (not calculated with historical data as are Control Limits) which reflect customer or product requirements. If the upper and lower specification limits are within the boundaries of the upper and lower control limits, the process is not capable of meeting the requirements. The process must be improved to meet the requirements.
The BAR GRAPH shows comparisons. Bars make it easier to recognize small differences in quantities or frequencies between categories. Data points that are plotted on "X" and "Y" axes are highlighted by vertical "bars" rising from the "X" axis. A bar graph gives an easily understood visual display of how one, or more, set of data compares to another.

**EXAMPLE:**

![Bar graph showing injury rate (per 1000 employees) by day of the week.]

**PROCEDURE:**

1. Draw horizontal (X) and vertical (Y) axes. On the "X" axis, put marks to separate data groups or comparison units of measurement and label them appropriately (examples: product type, departments, machine, shift, year, month, etc.). On the "Y" axis, draw marks representing frequency or quantity and label the marks with the appropriate designations (try to use ten marks or less).
2. Collect data for each of the groups to be analyzed.

3. Enter data by placing a point at the proper measured proportion over the proper data group.

4. Draw non-touching vertical bars of uniform width from the "X" axis to the dot in each of the data groups. The left most bar should not touch the "Y" axis.

5. Label the chart with other pertinent information (data, source block, population or sample size, good arrow, axes labels, title of graph, etc.).

6. Make sure all numbers and print are legible and large enough to read easily.
The **LINE GRAPH** shows patterns such as trends over time. Line graphs are used to visually represent data that reflect the results of a process to see whether or not the long range average is changing. Data points are plotted on "X" and "Y" axes in the order in which they occurred. These points are connected by straight lines. A line graph is an excellent tool for highlighting change over time.

**EXAMPLE:**

![Line Graph Example](image-url)

**NUMBER OF ERRORS**

- **Source:**
  - When: 1/97
  - Where: QC Data
  - Who: JPC, x1965

**PROCEDURE:**

1. Draw horizontal (X) and vertical (Y) axes. On the "X" axis, put marks to separate data groups, such as time periods covered, and label each group accordingly. On the "Y" axis, draw marks representing frequency or quantity observed and label the marks with the appropriate measurements (try to use ten marks or less).
2. Enter the data by placing a point even with the proper mark on the "Y" axis over the proper data group (e.g. time measurement) in the order that it was gathered.

3. Draw straight lines connecting the points, making the graph easier to interpret.

4. Label the chart with other pertinent information (source block, population or sample size, good arrow, axes labels, title of graph, legend, etc.).

5. Solid lines should always be used to plot historical information. Dotted lines typically represent projections of future trends.
The **PIE CHART** shows percentages and the relative proportion of each category to the whole. It is a chart in which the entire circle represents 100% (not 360 degrees) of the data to be displayed. The circle is divided into percentage "slices" that clearly show the largest shares of data. The circle being divided by different portions of information, resembles a "pie". A pie chart is useful and very easy to understand because a picture of the situation can be absorbed at a glance.

**District Expense Budget ($000)**

**EXAMPLE:**

![Pie chart image](image)

**PROCEDURE:**

1. Draw a doughnut, or a circle within a circle.

2. Inside the small circle, enter the sample or population size in units (e.g. \( n = 120,000 \)).
3. Calculate the size of each slice. Divide the value of the item by the total value of all items, then multiply:

- by 100 to get percentage;

\[ \frac{\$20,400 \text{ (MENTAL HEALTH)}}{\$120,000 \text{ Total Population}} = 0.17 \times 100 = 17\% \]

$120,000$

- and by 360 to get degrees;

\[ \frac{\$20,400}{\$120,000} = 0.17 \times 360 = 61^\circ \]

A protractor should be used to plot the degrees for each slice to ensure accurate graphical representation.

4. Label each slice with the item description and percentage number that it represents. Also label the chart with other pertinent information (data, source block, population or sample percentage, title, etc.). A different shade, color or texture to a particular slice can draw the reviewer's attention to your area of focus.

Note: Always start dividing the pie at 12:00 noon and, moving clockwise, the percentages proceed from largest to smallest slice.
A HISTOGRAM is a visual representation that plots a variable against the number of occurrences. It can provide information on the degree of variation of the data as well as show the distribution pattern of data by bar graphing the number of units in each category. A histogram takes variables (measurement) data (e.g. temperature, weight, height, dimensions, etc.) and displays its distribution. The picture that histograms provide about the distribution of your process outcomes can help you determine what the problem might be. Dispersion of the data can produce a wide variety of histogram shapes, each telling its own story (see pages 4-32 and 4-33).

EXAMPLE:

Histogram
(Weight of Boxes at Which Back Injuries Occurred)

<table>
<thead>
<tr>
<th>Weight (Pounds)</th>
<th>59.5</th>
<th>62.5</th>
<th>65.5</th>
<th>68.5</th>
<th>71.5</th>
<th>74.5</th>
<th>77.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Back Injuries</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Source
When: 1/92
Where: SAFDATA
Who: JCE, x4091
**PROCEDURE:**

<table>
<thead>
<tr>
<th>STEP</th>
<th>EQUATION</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Start with a set of at least 30 data points. (e.g. Weight of boxes, in pounds)</td>
<td>64, 63, 66, 73, 60, 69, 68, 70, 65, 61, 66, 76, 69, 71, 73, 62, 70, 65, 72, 63, 73, 74, 70, 66, 68, 72, 75, 76, 69, 70, 72, 70, 76, 73, 65, 69</td>
</tr>
<tr>
<td>2</td>
<td>Arrange the data point values by increasing or decreasing order.</td>
<td>60, 61, 62, 63, 64, 65, 65, 65, 65, 66, 66, 66, 67, 68, 66, 69, 69, 69, 70, 70, 70, 70, 70, 71, 72, 72, 72, 72, 73, 73, 73, 73, 74, 75, 76, 76, 76</td>
</tr>
<tr>
<td>3</td>
<td>Each value is a data point. Count the number of data points.</td>
<td>( n )</td>
</tr>
<tr>
<td>4</td>
<td>The range (R) of the set is the smallest (minimum) data point value subtracted from the largest (maximum) data point value.</td>
<td>( R = \text{Largest} - \text{Smallest} )</td>
</tr>
<tr>
<td>5</td>
<td>The class (K) is used to calculate the number of bars on the histogram. Class is equal to the square root of ( n ).</td>
<td>( K = \sqrt{n} )</td>
</tr>
<tr>
<td>6</td>
<td>The class width (W) is used to calculate the width of the bars. It is calculated by dividing the range (R) by the class (K).</td>
<td>( W = \frac{R}{K} )</td>
</tr>
<tr>
<td>7</td>
<td>To begin constructing the histogram, establish the starting point (SP) for the first class. This is calculated by:</td>
<td>Measurement Unit (M)</td>
</tr>
<tr>
<td></td>
<td>• Taking the measurement unit (e.g. single pounds) and dividing this value by 2, then</td>
<td>This ( M = 1 ) pound</td>
</tr>
<tr>
<td></td>
<td>• Subtracting the above result from the minimum value in the data set.</td>
<td>( SP = 60 - \frac{1}{2} = 59.5 )</td>
</tr>
</tbody>
</table>
### UNIT 4

**Histogram**

<table>
<thead>
<tr>
<th>STEP</th>
<th>EQUATION</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Develop a frequency table to categorize your data points by class limit.</td>
<td>Class Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>For the &quot;Class Limits&quot; column, add the class width (W) to the starting point.</td>
<td>$59.5 + W$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>For the &quot;Tally&quot; column, go back to your original set of data points. Tally those that fall within each class' limits. Add the items in the &quot;Tally&quot; column for each class and enter the result in the &quot;Frequency&quot; column.</td>
<td>Class Limits</td>
</tr>
<tr>
<td></td>
<td>59.5 - 62.5</td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>62.6 - 65.5</td>
<td>****I</td>
</tr>
<tr>
<td></td>
<td>65.6 - 68.5</td>
<td>****I</td>
</tr>
<tr>
<td></td>
<td>68.6 - 71.5</td>
<td>****I I</td>
</tr>
<tr>
<td></td>
<td>71.6 - 74.5</td>
<td>****I III</td>
</tr>
<tr>
<td></td>
<td>74.6 - 77.5</td>
<td>IIII</td>
</tr>
</tbody>
</table>

To construct the histogram, draw horizontal and vertical axes. The horizontal (X-axis) shows class limits; the vertical (Y-axis) shows frequencies. Draw a bar to represent the frequency of data in each class. **The bars should be touching each other**. There should be a half class width between the Y-axis and the left-most bar.
MEASURES OF CENTRAL TENDENCY:

There are three measures of central tendency:

- **Mean (Average)** - The sum of all the measured or counted data divided by the total number of data points; for example, all the data points in the previous example (STEP 1, page 4-28) added together equal 2,464; divided by 36 equal 68.4 pounds.

- **Mode** - The value repeated most often in the raw data. In this example it is 70 pounds. If the data are presented as grouped frequency as a histogram, we refer to the **modal class** instead of the mode. Modal class is the class interval with the highest frequency. In this example, the modal class is 68.6 - 71.5 pounds.

- **Median** - The middle of all the measured or counted data points. For example, in our data of 36 samples the median value is the average of the two middle values since there is not a single middle value (69+70=139 divided by 2 = 69.5 pounds).

WHEN WOULD YOU USE A HISTOGRAM?

1. **To set goals or targets.** Once the histogram is constructed, the team may choose to reduce the extreme variation in the process.

2. **To show process capability.** If specification limits or the customer's requirements are available, they can be plotted on the histogram to show how much the product (or service) is not meeting requirements.
3. To stratify data. When the data are stratified by the factors thought to be causing variation (i.e., location, machine, materials, time, ) the causes of the variation become detectable.

4. To confirm results. By comparing histograms before and after countermeasures have been implemented, a shift in the data distribution can indicate effectiveness in attacking root causes of the problem.

VARIATION:

If all of the factors in a process could remain constant, everything produced would be the same, and there would be no need for quality control. However, nothing remains perfectly constant, therefore, it is our task to deal with variation.

Understanding and controlling variation, the key to successful quality control, are done by taking samples from a population, measuring the characteristics of the process and improving the process, if necessary. The histogram provides us the tool to visualize that variation.

A histogram provides a snapshot of a group of data in a period in time. It shows the distribution and allows us to examine a large amount of data in one picture. Histograms are used for variables (measurable) data only. Attribute data are shown on a frequency chart (not taught in this course).
HOW TO INTERPRET HISTOGRAMS:

NORMAL OR "SYMMETRIC" TYPE:
This is the most commonly occurring histogram. Most values fall toward the center of the distribution (central tendency) with the variation balanced on both sides of the center. The mean, median and mode are the same.

SMALL VARIABILITY:
This chart shows that there are few values falling on the positive or negative side of the center of distribution (central tendency). The range of the sample being analyzed is relatively narrow.

LARGE VARIABILITY:
This chart shows that there is a wide range of values falling on both sides of the center of distribution.
**POSITIVELY SKewed:**
A positively skewed variation demonstrates most values in the sample falling on the positive, or left, side of the center of distribution.

**NEGATIVELY SKewed:**
A negatively skewed variation demonstrates most values in the sample falling on the negative, or right, side of the center of distribution.

**BI-MODAL TYPE:**
In a bi-modal (or twin-peaked) type, two modes (two peaks) appear. This usually occurs when two different data groups are mixed (e.g. population of very short people is added to a population of extremely tall people). In effect, we have two histograms "pushed" together.
A **PARETO CHART** is a graphical Q.C. tool used to rank data. This helps us to determine which problems to solve in what order. It distinguishes between the "significant few" and the "trivial many". The Pareto Chart is an excellent tool to organize and analyze data. It can be used in these ways:

- To identify the most serious or most frequently occurring problems through the use of different measurement scales (frequency, cost, etc.). It is based on the concept that 80% of the problems (or, at least a "large" percentage) result from 20% of the causes.

- To analyze different groupings of data (by program, district, month, etc.).

- To measure the impact of changes made in a process (**before** and **after** comparisons).

- To break down broad problems or causes into more specific components for better understanding.

**EXAMPLE:**

![Pareto Chart Example](image-url)
PROCEDURE:

1. Draw one horizontal (X) and two vertical (Y) axes. On the "X" axis, draw marks to separate data groups or units of measurements. On the left "Y" axis, draw marks representing frequency or quantity and label the marks with the appropriate designations, and marks representing cumulative percentage up to 100% on the right "Y" axis.

2. Collect data for each of the groups to be analyzed.

3. List the categories (or data groups) from left to right on the "X" (horizontal) axis in their order of decreasing frequency or magnitude. The categories containing the fewest items can be combined into an "other" category, which is always placed on the extreme right as the last bar.

4. Enter data by placing a point at the proper measured position over the proper data group.

5. Draw touching vertical bars of uniform width from the "X" axis to the point in each of the data groups.

6. Draw a cumulative frequency line beginning at zero (x,o), (y,o) and proceeding through the top right corner of the first bar moving upward from left to right (this shows the cumulative frequency percentage of the categories).

7. Label the chart with other pertinent information (source block, population or sample size, etc.).
USES OF PARETO CHARTS:

Pareto Charts are useful throughout the problem solving process. Data displayed in Pareto Charts may be stratified in different ways, such as:

1. **By Characteristic** - used to find out what the major problem is, and could be used in Step 2 of the QIC Story process.

   Some examples are:
   - Quality - complaints, failures, errors.
   - Cost - productivity, error rate losses.
   - Delivery and Time - late payments, delays in providing a service.
   - Safety - accidents, injuries, doctor cases.

2. **By Causes** - used to help determine the degree and contribution from several causes of the problem in Step 3 of the QIC Story. In this case, the Pareto may be used to help verify root causes.

   Some examples are:
   - Equipment - computer program, supplier.
   - Materials - manufacturer, type, supplier.
   - Method - procedure, conditions, process, process step.
   - Person - department, work experience, provider.
The **SCATTER DIAGRAM** is used to determine if there is a relationship or correlation between two variables. It is used to display what happens to one variable when another variable changes in order to test a theory that the two variables are related. The data displayed on the scatter diagram clearly show if there is a positive, negative or no relationship between the two variables.

**EXAMPLE:**

![Scatter Diagram Example]

**DURATION BY TIME OF DAY**

- **n=40**
- **Positive Correlation:** When X increases, Y increases

**SOURCE**

- **When:** 1991
- **Where:** NY, NY
- **Who:** ACG-550
PROCEDURE:
1. Collect at least 30 sets of paired data ("X" and "Y").

2. Find the maximum and minimum values of "X" and "Y".

3. Draw "X" and "Y" axes. Determine the scales of the axes so that they are more or less equal in length (try not to have more than ten graduations).

4. Label the "X" axis as the suspected "driving factor" (independent variable). Label the "Y" axis as the one influenced by it (dependent variable). Complete the chart by adding other pertinent information (source block, sample size, title, etc.). The "X" axis is the potential root cause and the "Y" axis is the effect or quality characteristic.

5. Plot the data by drawing a point where the paired numbers intersect on the graph.

6. Draw a "trend line" through the middle of the data points. The direction of this line tells you what type of relationship, if any, exists. The strength of the relationship is determined by how close the data points are on the line.

Note: Be sure the data have been previously stratified. If not, the conclusion drawn could be invalid.
HOW TO INTERPRET SCATTER DIAGRAMS:

POSITIVE RELATIONSHIP:
A positive correlation exists when the data points form an upward slant to the right. A positive pattern tells us that as the independent variable increases, the dependent variable also increases.

NEGATIVE RELATIONSHIP:
A negative correlation exists when the data points form a downward slant to the right. A negative pattern tells us that as the independent variable increases, the dependent variable decreases.

NO RELATIONSHIP:
When the data points do not form any identifiable shape, we can say that no relationship seems to exist between the two variables.
UNIT 5
Techniques

PURPOSE
The purpose of this unit is to introduce you to key techniques which support the QIC Story.

AGENDA
- Discuss the following techniques in detail:
  1. Action Plan ........................................... 5-1
  2. Barriers and Aids ................................. 5-3
  3. Brainstorming ..................................... 5-5
  4. Consensus .......................................... 5-8
  5. Countermeasures Matrix ....................... 5-10
  6. Cost-Benefit Analysis .......................... 5-14
  7. Flowchart .......................................... 5-16
  8. Multivoting ........................................ 5-18
  9. Pairwise Ranking ................................. 5-20
  10. Poka-Yoke ........................................ 5-23
  11. Problem Statement ............................... 5-25
  12. Project Planning Worksheet ................. 5-28
  13. Radar (Spider) Chart ......................... 5-32
  14. Survey - Interview ............................. 5-34
  15. Theme Selection Matrix ........................ 5-36
ACTION PLAN

An Action Plan is an outline of who will do what, when, and by what methods. It ensures that nothing is left to chance as you set out to implement a new way of doing things. An action plan encourages you to think in a systematic and comprehensive way about all the activities necessary to begin implementing the team's countermeasures.

EXAMPLE:

![Action Plan Table]

*ROOT CAUSE:* Poor Assessment Skills  
*COUNTERMEASURE:* Provide Training  
*PRACTICAL METHOD:* Develop & Implement Training Internally  
*ACCOUNTABLE PERSON:* D.L.W.

**AGENCY OBJECTIVE**  
**DISTRICT OBJECTIVE**  
**INDIVIDUAL PROJECT**  
**PREPARED BY**

**LEGEND:**  
- PLAN  
- ACTUAL
PROCEDURE:

1. Discuss and come to agreement on the following:
   - What needs to be done (specific tasks, arrangements, etc.)?
   - When does it need to be finished?
   - Who will do it?
   - How will it be done?
   - What resources are needed (materials, equipment, expertise, etc.)?
   - Are there any special considerations (approvals needed, other departments affected, etc.)?

2. Record all agreements and completion dates on the Action Plan Worksheet.

3. Review the plan on a timely basis and update as needed.

The Barriers and Aids Analysis is one source for steps to include in the Action Plan. The plan is a living document and should be reviewed frequently.

Items to consider when developing an action plan:

1. Analyze the proposed countermeasure or practical method (project) and break it down into steps (activities or tasks) required to accomplish it.

2. When describing the task, make sure it is at the task level. If the task is complex and could really qualify as a project, make sure a secondary action plan is created for that project that specifies all the tasks required for completion (see page 9-6 for Task Assignment Plan).

3. Consider all resources needed: people, equipment, time, training, etc.
BARRIERS AND AIDS ANALYSIS

Barriers and Aids Analysis is a technique that is used to identify elements which impede (barriers) or facilitate (aids) change.

Barriers and Aids Analysis helps teams to carefully analyze a situation when they are planning for change. Once barriers and aids are identified, the team can make plans to use the available aids and/or to overcome the barriers which can prevent effective implementation of a countermeasure.

PROCEDURE:
1. Identify the countermeasure, practical method, task, change or concern.
2. Identify (through brainstorming) possible barriers and put them in a list.
3. Identify and list likely aids.
4. Rank all listed barriers as high, medium, or low.
5. Match aids which balance or overcome barriers.
   (Note: it is not necessary to come up with an aid for every barrier.)
6. Identify items needing team action using your rankings (high, medium, low).
7. Develop an Action Plan to overcome the high, and possibly medium, ranked barriers which do not have off-setting aids.
When is Barriers and Aids Analysis Used?

After a team has identified the most appropriate countermeasures and practical methods, it can use Barriers and Aids Analysis to assist in planning the trial implementation. The Barriers and Aids Analysis is used in conjunction with developing the Action Plan.

<table>
<thead>
<tr>
<th>BARRIERS AND AIDS ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Countermeasure:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Barrier Impact</th>
<th>Forces Pushing Against (-) (Barriers)</th>
<th>Forces Pushing For (+) (Aids)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **H** = High  
- **M** = Medium  
- **L** = Low

- What could prevent the successful implementation?
- If after a year the implementation failed... what could have been a likely reason?
- What force, method, element, or entity exists today that could assist in implementation?
Brainstorming is a method used by a group of people to produce a large number of creative ideas in a relatively short period of time. It is an effective technique because of two main principles:

1. Delayed Judgment - People are able to produce more ideas when they delay evaluation of ideas until a later time.

2. Extended Effort - More original and useful ideas are created when the group continues to generate ideas beyond the initial, more obvious responses by filling an agreed upon time limit or an agreed upon number of ideas. The emphasis in the Generation Phase of a brainstorming session is always on the "quantity" of ideas not the "quality". The quality will come later when ideas are clarified and evaluated.

PROCEDURE:

1. The leader selects the method of brainstorming that will be used and informs the team. It will usually be one of two popular types;
   - **Structured or Round Robin** - In this type, each member of the group gives an idea as her/his turn arises in rotation around the table, or passes until the next "round". It is a good method to obtain everyone's participation but can also create a certain amount of pressure to contribute.
**Brainstorming**

- **Unstructured Open Forum or Green Lighting** In this type, group members give ideas as they come to mind in a spontaneous manner. It tends to create a more relaxed atmosphere but also risks domination by the most vocal members.

2. The leader clearly states the topic and purpose of the brainstorming session. Everyone agrees on the topic or issue. The topic is then written and placed in a prominent, visible position.

3. A recorder is selected to record all ideas on a flipchart or viewgraph transparency for all to see. Always having the words visible to everyone at the same time avoids misunderstandings and helps to inspire other new ideas.

4. The leader reviews the following "Rules for Brainstorming" with the group.
   - No discussion, comments or evaluation of any idea during the generation phase.
   - All ideas will be recorded.
   - Quantity not quality is important during the generation phase.
   - Wild ideas are welcome.
   - State ideas briefly and clearly.
   - Build on recorded ideas.
5. Begin the brainstorming session by posting ideas on the flip chart. Make sure all ideas remain visible to the team. Continue until the agreed upon time is used or the agreed upon number of ideas are generated. This is the **Generation Phase** of Brainstorming.

6. During the **Clarification Phase** of Brainstorming, the team goes over the list to make sure that everyone understands all of the items. Do not discuss ideas. Criticism and discussion will take place during the **Evaluation Phase** and in **Multivoting** (Unit 5, page 18).

7. Finally, during the **Evaluation Phase**, the team reviews the list to eliminate duplications, irrelevances and issues that are off limits or cannot possibly be addressed or acted upon by this team.

**When is Brainstorming used?**

Brainstorming is used as a data-gathering technique to:
- Collect improvement opportunities and/or problem areas (themes).
- Identify possible causes when constructing a Cause and Effect Diagram.
- Suggest possible countermeasures and practical methods.
- Identify barriers or aids to action plans.
**CONSENSUS** is a group decision making process that takes each member's ideas and opinions into account and results in a decision that everyone in the group can support. It is an effective method for decision making because it involves every member's participation. Consensus improves decision quality, equalizes power, causes examination of alternatives, increases commitment to implement the decision and promotes unity among the team members.

**PROCEDURE:**

1. The leader clearly lists the alternatives the group has to choose from and opens the topic for discussion.

2. Each member of the group shares her/his ideas and opinions about what each feels the group's decision should be. During the discussion, the following guidelines are followed:
   - Avoid arguing your own point of view. Present your views and then listen to what others have to say.
   - Look for common ground and areas of agreement where members can agree on something, and work from there. Always look for a solution everyone can agree to.
• Once your idea is clearly understood by the others, release "ownership".
• Trust the team to evaluate your idea and make the right decision.
• Never criticize others or their ideas. People and their ideas are valuable and should be treated with respect.
• Conflicts and differences of opinion should be viewed as "helpful" input.

3. When the leader feels that the team is beginning to come to a common agreement, he/she will clarify the position and ask the team if there is a consensus. If everyone agrees that it is the best decision, or feels that it is a decision that they can support, they state their agreement and the leader confirms the decision. If a member has new information or clarification of previous information that may be helpful to the team, time is spent discussing the concern and the process continues until consensus is achieved.

<table>
<thead>
<tr>
<th>THE GOALS OF CONSENSUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Eliminate a &quot;we-they&quot; feeling.</td>
</tr>
<tr>
<td>• <strong>Focus on the problem</strong>, not on personalities, position, or points of view.</td>
</tr>
<tr>
<td>• Reach a &quot;win-win&quot; decision.</td>
</tr>
<tr>
<td>• Develop <strong>team ownership</strong> to the decision.</td>
</tr>
</tbody>
</table>
Sometimes those who have been involved in Quality Improvement talk as though the solution "falls out automatically" at the end of the process. There are occasions on which only one solution is possible (build or not build, buy or not buy), but these are rare. As much care should be taken in choosing a solution, or countermeasure, as at any other stage of the process. The team should work from its collected information, research options, be as creative as the issue will allow, and be diligent in the pursuit of not just an adequate answer but the most appropriate answer.

Some possible countermeasures will be obvious. Brainstorming, interviewing, and management suggestion are all good sources of potential countermeasures. Once the most likely have been chosen, they should be investigated. What will they involve, how many people and how much money and time?

A principal technique at this stage is the **Countermeasures Matrix**. After the team has selected the appropriate countermeasures, it will develop an Action Plan to implement these countermeasures. The term "countermeasure" is appropriate, because at this point, we are not sure that the action to be taken is really a solution. Only after the results are obtained and tracked over time, can we be sure it is a "solution".
COUNTERMEASURES MATRIX

A Countermeasures Matrix is a matrix of factors to help the team show the relationship between effect, root causes, countermeasures and practical methods. It also helps the team to evaluate which countermeasures and related practical methods should be implemented.

Why is the Countermeasures Matrix useful?

We use it to ensure the countermeasures address the significant root causes. This matrix guides the team in verifying root cause(s), identifying alternative countermeasures, and determining the effectiveness and feasibility of their countermeasures. Other prioritization matrices may be used to evaluate countermeasures, but this one can be easily used by most teams.

PROCEDURE:

1. After verifying the significant root causes, the first two columns of the matrix may be filled in ("Problem" and "Root Causes").

2. Next, the team identifies countermeasures which address each of the root causes and enters them in the appropriate "Countermeasures" boxes.

3. In the "Practical Methods" box, a specific task(s) is listed to accomplish each countermeasure. There may be several alternative practical methods to consider for each countermeasure.
4. The team then rates each of the practical methods numerically by effectiveness and feasibility. The higher ratings go to those countermeasures which are more effective and more feasible.

5. The ratings are then multiplied and the practical methods ranked for implementation according to their overall rating.

6. To determine how many of the countermeasures should be implemented, the team will need to consider its resources and its target for improvement. Sufficient countermeasures need to be implemented to achieve the target established in STEP 2, or the target may need to be adjusted, if mutually agreed upon by management.

7. The team will indicate if the practical method will be implemented by writing either "yes" or "no" in the action column.

When is the Countermeasures Matrix used?
The **Countermeasures Matrix** is used after the team has identified those countermeasures which address the significant root cause(s).
COUNTERMEASURES MATRIX

PROBLEM

ROOT CAUSES

These are the problem that needs correction.

These are identified on the Cause and Effect diagram and have been verified.

These are specific tasks aimed at the root causes and are within the team's ability to implement.

These are specific tasks needed to accomplish the countermeasure. A countermeasure is the "what", the practical method is the "how".

This is a rating based on how much the countermeasure will reduce the root cause. The higher rating goes to the more effective countermeasure.

This is a rating based on the time, cost, work, acceptance, etc., needed to implement the countermeasure. The higher rating goes to the more feasible practical method.

This is the product of Effectiveness X Feasibility. This should serve as a basis for the ranking of the practical methods for the action plan.

This can be indicated by a YES or NO if action will be taken.

SCALE: 1=Negligible 2=Somewhat 3=Moderate 4=Very 5=Extreme
COST-BENEFIT ANALYSIS
The cost of implementing a countermeasure should always be weighed against its benefits. **Cost-Benefit Analysis** is used to compare the costs and benefits (in dollars) of a plan. It is used to estimate financial impact. It helps in choosing a plan that will give the most benefits for the least cost. As part of the **QIC Story** process, a Cost-Benefit Analysis allows you to compare one proposed practical method with another. This will provide you with valuable information, but it does not make decisions for you. It is desirable for benefits to be greater than costs, but the difference will vary from one situation to another. In fact, even if you spend more than you save, the results in terms of quality, safety, morale, or decreased job frustration can be worth it. A Cost-Benefit Analysis is another important technique for helping teams make decisions about the feasibility of the practical methods of countermeasures.

**EXAMPLE:**

<table>
<thead>
<tr>
<th>TYPES OF COST</th>
<th>VALUE</th>
<th>TYPES OF BENEFITS</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Software</td>
<td>$1,800</td>
<td>Less Labor Hours</td>
<td>$8,000</td>
</tr>
<tr>
<td>Training</td>
<td>$1,900</td>
<td>Less Errors</td>
<td>$350</td>
</tr>
<tr>
<td>Other Materials</td>
<td>$425</td>
<td>Happier Customer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL COST</strong></td>
<td>$4,125</td>
<td><strong>TOTAL BENEFITS</strong></td>
<td>$8,350</td>
</tr>
</tbody>
</table>

**COST - BENEFIT RATIO =**

**BENEFITS**

**COST** = **DECISION**
PROCEDURE:
1. Determine the time period to which your analysis will apply. (In many cases, costs and benefits are calculated over a period of one year. More complex projects may be based on 1-15 year time horizons.)
2. Brainstorm a list of the cost factors, both obvious and less obvious, related to the practical method. Examples of less obvious cost factors are overtime, training, maintenance, safety, inventory, scrap, etc.
3. Determine the cost associated with each factor. You may have to estimate these costs. Subject matter experts may provide insight to cost factors.
4. Determine the total cost for the practical method.
5. Brainstorm a list of the benefit factors, both obvious and less obvious, related to the practical method. Examples of less obvious benefits are: less overtime, less training, safer operation, lower inventory, better customer satisfaction, etc.
6. Determine the value (savings or avoided costs) associated with each benefit.
7. Add the total financial benefits of the practical method.
8. Divide the value of the total benefits by the total costs to determine the ratio of benefits to costs. (Item #7 ÷ Item #4.)
9. Analyze and discuss the total cost-benefits and reach consensus on your decision as to whether or not the countermeasure and practical methods are feasible.
FLOWCHART

A Flowchart is a pictorial representation showing all the steps of a process and their sequence. It can be a useful technique for examining how various steps in a process are related to each other. By studying a flowchart you can often discover redundancies or loopholes which are potential sources of unnecessary work, costs or customer dissatisfaction.

PROCEDURE:

1. Use the following elements for a simple flowchart:
   - Circle: Beginning and ending steps.
   - Box: Activities within the process.
   - Diamond: Points where decisions are required ("yes" or "no" answers only).
   - Arrow: The direction or flow of activity.

2. Gather together people who can represent and have a good understanding of the various steps throughout the process.

3. Decide where the process begins and arrange the activities and decision points in their proper sequence using arrows to show direction of flow. Break down complex activities as needed.

4. Across the top of the flow chart, list the "players" of the process (i.e., individuals, customers, departments, etc.).

5. Down the left side of the flow chart, identify the "macro" or major steps or phases of the process.
EXAMPLE:

<table>
<thead>
<tr>
<th>WHO STEP</th>
<th>CUSTOMER</th>
<th>SUPPLIER</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEED</td>
<td>• NEEDS SUPPLIES</td>
<td>• RECEIVE FORM / INFO</td>
</tr>
<tr>
<td></td>
<td>• REVIEWS INFORMATION</td>
<td>• REVIEW FORM / INFO</td>
</tr>
<tr>
<td></td>
<td>• COMPLETES ORDER FORM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• SUBMITS ORDER FORM</td>
<td>• INFO COMPLETE?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• REQ. ADD'L INFO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SECURE SUPPLIES ON ORDER FORM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SEND TO CUSTOMER</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REC.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• RECEIVES SUPPLIES</td>
<td>• RECEIVES SUPPLIES</td>
</tr>
<tr>
<td></td>
<td>• INSPECTS SUPPLIES</td>
<td>• INSPECTS SUPPLIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• NOTIFIED SUPPLIER</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• NOTIFIED SUPPLIER</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• NOTIFIED ALL OK?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• NOTIFIED ALL OK?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SEND PAYMENT FOR SUPPLIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SECURE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REC.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSPECT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOTIFY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEND</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MULTIVOTING is a structured process of voting by a team that helps reduce a list containing a large number of items down to a manageable few (usually three to five). Multivoting helps the team accomplish a list reduction with a high degree of group consensus. It is useful to reduce a "brainstormed" list of ideas or can be used to help a team arrange their list of potential improvement themes according to priorities.

PROCEDURE:

1. **First vote:** each person votes for as many items as desired, but only once per item. Check the items receiving a relatively higher number of votes than the other items. Example: A team has ten members. After voting, items receiving five or more votes are checked.

2. **Second vote:** count the checked items from the first vote. Each person gets to vote a number of times equal to half the checked items. Example: if twenty items are checked after the first vote, then each person gets to vote ten times during the second vote.
3. Continue multivoting until the list is reduced to a manageable three to five items. If the list is reduced to less than three items, there may be a danger of selecting items that may later be determined "off limits" by management. It may also be indicative of a team driven to a foregone conclusion. If more than five items are selected, the team will have to evaluate with data each theme's "need to improve" for more themes than may be practical.

**EXAMPLE:**

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Votes</th>
<th>Most Likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate job expertise</td>
<td>I-I-I-I</td>
<td></td>
</tr>
<tr>
<td><strong>Data not available</strong></td>
<td>I-I-I-I</td>
<td>✔</td>
</tr>
<tr>
<td>Interview forms poorly designed</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>Incorrect data provided by client</td>
<td>I-I-I-I</td>
<td>✔</td>
</tr>
<tr>
<td>Supervisor too busy to help</td>
<td>I-I</td>
<td></td>
</tr>
<tr>
<td><strong>Workload too high</strong></td>
<td>I-I-I-I</td>
<td>✔</td>
</tr>
<tr>
<td>Workstation inadequate</td>
<td>I-I-I</td>
<td></td>
</tr>
</tbody>
</table>
PAIRWISE RANKING

Pairwise ranking is a structured method for ranking a small list of items in priority order. It can help you:

- Prioritize a small list.
- Make decisions in a consensus-oriented manner.

How to do it:

*Construct a pairwise matrix.*

Each box in the matrix represents the intersection (or pairing) of two items. If your list has five items, the pairwise matrix would look like this, with the top box representing idea 1 paired with idea 2.

*Rank each pair.* For each pair, have the group (using a consensus-oriented discussion) determine which of the two ideas is preferred. Then, for each pair, write the number of the preferable idea in the appropriate box. Repeat this process until the matrix is filled.

1 and 2 compared: 2 is better.

1 and 3 compared: 1 is better.

...and so on until...
4 and 5 compared:
  5 is better.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

**Count the number of times each alternative appears in the matrix.**

Alternative 5 appears 4 times in the matrix.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Rank</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rank all items.** Rank the alternatives by the total number of times they appear in the matrix. To break a tie (where two ideas appear the same number of times), look at the box in which those two ideas are compared. The idea appearing in *that* box receives the higher ranking.

Alternative 5 ranks 1st overall.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Rank</td>
<td>3rd</td>
<td>2nd</td>
<td>4th</td>
<td>5th</td>
<td>1st</td>
</tr>
</tbody>
</table>
Pairwise Ranking Example

A QIC Story® project team was asked to recommend sites for testing a pilot program of their recommendations. A feasibility study produced a list of six possible locations. The team then used pairwise ranking to determine that Rockledge, FL was best suited for this particular test.

1. Boca Raton
2. Jupiter
3. Orlando
4. Rockledge
5. Stuart
6. Tavares

![Pairwise Ranking Diagram]

<table>
<thead>
<tr>
<th>Site</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Rank</td>
<td>3rd</td>
<td>6th</td>
<td>5th</td>
<td>1st</td>
<td>2nd</td>
<td>4th</td>
</tr>
</tbody>
</table>
POKA-YOKE

Poka-yoke is a technique used to prevent errors from resulting in defects. This concept originally gained wide-spread application in the area of industrial safety to reduce injuries. Since then its popularity has continued to increase in other areas, primarily manufacturing, to reduce defective product. There are poka-yoke systems and poka-yoke devices.

Poka-yoke Systems:

Poka-yoke systems are usually either “Control” or “Warning” systems.

- In control systems, process feedback is provided immediately and action must be taken before the process can continue (“Stop the process”).
- In warning systems, buzzers or warning lights are typically used to provide immediate feedback and the need for action.

Poka-yoke Devices:

Poka-yoke devices have the following characteristics:

- They have the capability for 100 percent inspections with significantly less effort than other sampling techniques.
- Poka-yoke devices can be developed and installed at relatively low cost.
Poka-yoke devices are commonly categorized into three (3) types:

Type 1
Eliminates the error at the source before it occurs.

Type 2
Detects an error in the process as it occurs before it results in a defect.

Type 3
Detects a defect after it has been made but before it reaches the next operation.

Poka-yoke is proving to be a powerful tool. It can be applied by any employee in any job to reduce defects, costs, and improve the quality of products and services to customers.
PROBLEM STATEMENT

A good Problem Statement precisely specifies the problem to be addressed. It should reflect the information the team has gathered to this point.

A Problem Statement must:

- **State the effect**, or what is wrong. It does not imply a solution. For example: "due to" or "lack of" type statements should be avoided because they imply solutions.
- **Be measurable.** The data from the indicator of interest should be included and highlight the problem and improvement target.
- **Be specific.** Answer the questions: who, what, when and where is the problem?

Writing a good problem statement is very important to the success of the QIC Story. It sounds simple, but is difficult to do. Below are some desirable criteria that should be incorporated, if possible:

- **Be Concise.** Choose the most descriptive and precise terminology to describe the problem.
- **Focus on the pain to the customer**, or how others are affected.
- **Show the gap between "what is" and "what should be".** Identify the difference between actual performance and target.
Problem Statement

Make sure it is understandable. Non-team members should be able to understand the problem your team is working on.

The problem statement is the effect. In Step 3, Analysis, the problem statement goes into the "head" of the Cause and Effect Diagram, described in Unit 4, page 5.

Learning Hint - "Four Ws, gap and pain" - for a good problem statement.

- Who?
- What?
- When?
- Where?

- Gap between "what is" and "what should be".
- Pain to the customer or stakeholder

It has been said, "a problem well stated, is a problem half solved." Clear definition of the problem can certainly help focus the team and move them in the right direction from the beginning. Taking time to correctly state the problem can also give a "second look" before moving on to the more time consuming processes of data collection and analysis. The problem statement describes as specifically as possible, the reason the situation should be changed.
PROCEDURE:

1. Structure a statement clearly stating the problem which answers the questions; who, what, when, and where (but not why), what the gap is, and what the pain is.

2. Evaluate the problem statement to see if it meets the above criteria.

3. Make any changes or improvements.
PROJECT PLANNING WORKSHEET

The Project Planning Worksheet provides a place for team information, team membership, attendance tracking and a project schedule.

Some pertinent items could include:

- Team name and members' names.
- Meeting attendance record.
- Project schedule.
- Recognition of individuals who provide support to the team, but are not team members, such as subject matter experts, or the team sponsor.
- Reference to the Goal and Objective to which this QIC Story is linked.
# Project Planning Worksheet

## Theme

### Problem / Situation Statement
(Summarize)

## Team Work Location

### Team Name

| Duration | (mm/yy) | through | (mm/yy) | Total Months:
|----------|---------|---------|---------|--------------
| Team Leader | | Team Member 7 |
| 2nd Team Leader | | Team Member 8 |
| Team Member 1 | | Team Member 9 |
| Team Member 2 | | Team Member 10 |
| Team Member 3 | | Team Member 11 |
| Team Member 4 | | Team Member 12 |
| Team Member 5 | | Team Member 13 |
| Team Member 6 | | Team Member 14 |

## Team Members

### Meetings

<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Time</th>
<th>Att.</th>
<th>#</th>
<th>Date</th>
<th>Time</th>
<th>Att.</th>
<th>#</th>
<th>Date</th>
<th>Time</th>
<th>Att.</th>
<th>Team Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
<td></td>
<td></td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td></td>
<td></td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td></td>
<td></td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td></td>
<td></td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>13</td>
<td></td>
<td></td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td></td>
<td></td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>15</td>
<td></td>
<td></td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>16</td>
<td></td>
<td></td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Outline of Activities

### Step

| Reason for Improvement |
| Current Situation |
| Analysis |
| Countermeasures |
| Results |
| Standardization |
| Future Plans |

### Comments
(How Each Step Was Done)

1. data\visio\projplanwkaht.vsd

5-29
UNIT 5

5-30  Project Planning Worksheet

The objective of the Project Planning Worksheet is to provide a planning structure for team projects which incorporates the "PLAN-DO-CHECK-ACT" methodology for a team, its supervisor and facilitator.

1. THEME
   Write in the theme statement from which the team will develop their specific problem and target for improvement.

2. TEAM MEMBERS AND WORK LOCATIONS
   List the names of team members, indicating the team leader with an asterisk. Also, list work locations.

3. TEAM NAME
   Enter the team's complete name.

4. TEAM INFORMATION
   Include any pertinent information selected by the team.

5. MEETINGS
   Date - Month and day that the meeting took place (e.g. 3/2 is March 2). Place an asterisk (*) by the day if the meeting was facilitated by a facilitator or supervisor; otherwise, just put the day.
   Length of time - Number of hours the team met.
   Percent Attendance - Number of team members attended divided by total number of team members. All this information should coincide with each meeting's respective minutes.
6. OUTLINE OF ACTIVITIES

Before your team begins the steps of the QIC Story process or at the end of Step 1, estimate the length of time that will be needed to complete each step. Indicate this by using the open-faced bar across the months for that step. A shaded bar below the open faced bar indicates the actual time spent on each of the steps. Place an asterisk (*) in the proper box for your projected presentation date(s).

7. DURATION

*   MONTH/YEAR that the team formed or when an experienced team collected potential themes.

**  THROUGH MONTH/YEAR that the team completed the QIC Story.

*** TOTAL MONTHS between these two dates.

8. COMMENTS

Give a brief synopsis of what QC or other tools were used to complete each step.

DISTRIBUTION:

- Original copy stays with the team leader.
- One copy is posted on the team's QIC Storyboard.
- One copy is routed monthly to the team leader's supervisor, facilitator or manager.
- This synopsis should be updated monthly.
RADAR CHART

In STEP 7, checkpoint 25 of the QIC Story Process, the team members are asked to reflect on their growth as a team and on the lessons they have learned.

One way to assess team growth is to use a Radar Chart to rate the before and after consensus scores in several categories, such as:

- Team Effectiveness, (A)
- Problem Solving, (B)
- Communication, (C)
- Organizational Knowledge, (D)
- Statistical Knowledge, (E)
- Computer Skills, (F)
- Contribution to Organizational Goals and Objectives (G), and
- Impact on the Quality of Work Life (H).

EXAMPLE:
PROCEDURE:

1. Choose the categories to be assessed "before" and "after" by the team. Categories chosen should reflect meaningful characteristics of professional growth.

2. Construct the chart by drawing a circle, dividing it into sectors and dividing each radius into ten segments.

3. Label the radii using the selected categories. Categories should reflect meaningful characteristics of professional growth.

4. Plot the ratings on the radii as agreed upon by the team (both before and after the QIC Story Process is complete).

5. Connect the dots (ratings) and observe weaknesses and strengths.

6. If appropriate, take action to address the weaknesses.

The Radar Chart serves as a graphical representation of personal and team growth. As people grow, the organization's capability increases.
SURVEY-INTERVIEW

A Survey-Interview is an important and useful method for collecting data. It usually requires face-to-face interviews, written questionnaires or, sometimes a combination of the two. Survey-interviews are not substitutes for collecting and analyzing factual information, but they can help substantiate or expand knowledge about the hard data you have. Many times they expose avenues for further analysis.

PROCEDURE:

1. Decide on what data you need. It helps to ask what happens, who does it, who receives it, who is responsible, where, what part, what section, when, how often, how does it happen, how much, how long?
2. Develop a set of questions you will need to get the necessary information. If it is to be a written questionnaire, consider the following guidelines:
   • Give the people answering the questions a clear idea of why you want the information.
   • Make the survey as brief as it can be to obtain the information you need.
     Think carefully about exactly what you need to know.
   • Make the survey easy to administer and to answer.
   • Phrase the questions in clear language, appropriate to the audience.
   • Leave enough space on the form so that answers can be recorded clearly.
   • Try to structure the questionnaire so that the information received can be stratified, if appropriate.

3. Do a trial run on a small group and from the results make whatever changes you need.

4. Target the audience and administer the survey.

5. Follow-up with participants to ensure a good response.

6. Provide feedback to the participants to let them know how the overall survey went.
THEME SELECTION MATRIX

The Theme Selection Matrix is a technique which helps the team clearly show why one theme is more important than any other. A theme which shows impact on the customer and a need to improve can provide incentive to the team and to management.

Themes may come from several sources, including:

1. Team Members may be aware of specific conditions or problems in their work processes.

2. Team Members may brainstorm and reach consensus on issues they feel may need further investigation.

3. Remaining problems from previous Performance Improvement Teams may be offered to the team for consideration.

4. Management may provide the team with one or more themes which have direct impact on an Agency or District Goal and Objective.
Theme Selection Matrix

What ever the source, the Theme Selection Matrix is a valuable technique for prioritizing or ranking themes because:

1. It considers the **impact on the customer, or stakeholder**. If it is important to our customers - it must be important to us.
2. It considers the **need to improve**. Indicators of current performance provide a factual basis for improvement needs.

It is this combination of "customer" orientation and "need to improve" that provides the team an objective approach for ranking, or prioritizing themes.
<table>
<thead>
<tr>
<th>THEMES</th>
<th>IMPACT ON CUSTOMER</th>
<th>X</th>
<th>NEED TO IMPROVE</th>
<th>=</th>
<th>OVERALL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THEMES:</td>
<td>IMPACT ON CUSTOMER:</td>
<td>NEED TO IMPROVE:</td>
<td>OVERALL:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>After reaching consensus, the team lists 3 to 5 themes that;</td>
<td>The team evaluates data or indicators that represent the theme. Comparing past performance to present or our performance to a customer's desired level are excellent approaches to determine the &quot;Need to Improve&quot;. Facts are required to ensure objective ratings. A score is given using the scale beneath the matrix. For example, a theme with an extreme Need to Improve would be given a score of &quot;5&quot;.</td>
<td>Multiply the scores for each theme from the &quot;Impact on Customer&quot; and the &quot;Need to Improve&quot; columns to get an overall score for each theme. The theme with the highest score is selected for the theme.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. The members feel they would like to work on.</td>
<td>2. Are within the team's ability to influence.</td>
<td>3. Can be evaluated in quantifiable terms.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCALE:</td>
<td>1 = NONE</td>
<td>2 = LOW</td>
<td>3 = MODERATE</td>
<td>4 = HIGH</td>
<td>5 = EXTREME</td>
</tr>
</tbody>
</table>
Unit 6

Leadership
OVERVIEW

The Team Leader's primary objective is to successfully guide the team to a solution of its chosen or assigned problem which is effective, cost-sensitive, and timely. In addition, the Team Leader must carefully balance task and people issues during the journey. This unit deals with some of the leadership issues that the Team Leader must deal with.

LEARNING OBJECTIVES

Upon completion of this unit, you will be able to:

• Understand the attributes of a successful meeting.
• Understand the difference between accountability and responsibility and how to assure compliance by appropriate team members.
• Understand the need and methods to balance people and task issues.
• Understand what a Management Presentation is and why it is so important.
• Understand the purpose and different aspects of Recognition.
• Understand the Team Leader's instructional role and how adults learn best.
A. WHAT IS AN EFFECTIVE MEETING?

An effective meeting is a meeting:

- which is necessary.
- which includes all individuals required to accomplish the intended PURPOSE*.
- which covers the AGENDA*.
- where people know what is expected of them.
- where the real issues are on the table and being dealt with and where most hidden agendas are legitimized and surfaced for discussion.
- where decisions and commitments are made, plans are developed, problems are solved.
- where people leave knowing what was accomplished and what they are to do.
- which meets its intended PURPOSE*.
- which respects people by starting and ending on time (LIMIT*).

B. WHY ARE EFFECTIVE MEETINGS IMPORTANT?

Because organizations spend 7.15 percent of their personnel budgets, 35% of middle management's time, and 60% of top management's time in meetings.

*for more information on P.A.L. (Purpose, Agenda and Limit of a meeting), see page 1-9 and 10.
C. WHEN ARE MEETINGS NEEDED?

Meetings are useful:

• for group problem solving.
• for sharing information or advice.
• for building commitment to a common goal.
• for addressing problems or issues that involve a number of people.
• for planning.
• for defining accountability and responsibility.
• for group decision making.

D. HOW ARE THEY CREATED?

• **Send a draft of the agenda.** The person calling the meeting should send out information on the agenda so that the purpose, time frames and topics are clear before people come to the meeting.

• **Start the meeting on time.**

• **Revise and agree on an agenda.** Add agenda items suggested by others attending the meeting, as appropriate. Finalize and agree on the agenda.

• **Agree on ground rules.** See unit 1, page 8.

• **Encourage active participation from all members.**
Choose a process facilitator. To ensure an effective meeting, someone needs to take responsibility for managing the process portion of the meeting. Frequently, because of their involvement in the content of a meeting, Team Leaders and other accountable people are unable to manage both the process and the content of a meeting. At such times, it is helpful to assign the role of facilitating the process to another team member or to bring in a facilitator. The process of facilitation helps the group stay focused on the intended purpose and agenda, manages the time limits and renegotiates them if necessary. Meeting participants are expected to help the "process person" manage the meeting time and content. There should be a clock visible to participants.

Focus the discussion. Clarify and summarize as necessary to facilitate mutual understanding of perspectives and ideas. When people wander off the subject, point out that the group has changed topics. Should this happen repeatedly, encourage the group to choose to either return to the intended focus or, if necessary, to deliberately re-direct the purpose of the meeting. Make the decision to change the content of the meeting continuously and explicitly, don't just let the conversation wander.
• **Decide how to decide.** Determine how decisions will be made in the meeting - by consensus, by multivoting, by majority voting, or by the team leader.

• **Address all items raised.** Insure that all items raised are addressed by the end of the meeting and that the person who raised the item knows what the next step will be. Specifically:
  • Decide whether or not the item will be addressed by this particular group.

If yes, • Decide whether it will be addressed:
  • in this meeting,
  • in another meeting
  • by being assigned to a person or group.

Check with the person who raised the issue to ensure they know what needs to happen next to get the issue addressed and that the proposed plan meets their needs.
*PARKING LOT = strategy for recording and postponing items raised during a meeting. Create a side list of items to be addressed later. Before the meeting adjourns, review ALL "parked" items and decide:

- whether this group will address the item or refer it elsewhere, and if the item will be addressed by the group, decide when and how it will be addressed - (e.g., agenda next meeting, assign)
- communicate decisions to the person who raised the item.

- Summarize results, agreements, next steps. Acknowledge agreements. At the close of the meeting review the decisions and agreements and other accomplishments that happened in the meeting, and review the next steps. WRITE IT ALL DOWN! Acknowledging and celebrating what was accomplished at a successful meeting gives people a sense of progress, and rewards them for the time and effort the meeting required. It also encourages them to work to make the next meeting productive.
- End the meeting on time.
The Three Laws Of Meetings

• Unite the group.
  - Chief danger: Aggression
  - Techniques: Let off the steam
               Do not take sides
               Bring in the others
               Stick to the facts

• Focus the group.
  - Chief danger: Getting off the point
  - Techniques: Stay alert
               Keep a hand on the wheel
               Test comprehension
               Paraphrase/check back

• Mobilize the group.
  - Chief danger: Squashing
  - Techniques: Protect the weak
               Check around the group
               Record suggestions
               Build up ideas
ACCOUNTABILITY. The accountable person is the person who must answer for a commitment, who is ultimately responsible for getting something done, or who people will count on for achieving or producing an agreed upon result by the agreed upon time or date. There should be only one person primarily accountable for achieving a given goal or target. Shared accountability usually means no accountability.

The "accountable person":

- is empowered by their team to speak for the team - e.g., make commitments and requests for the team.
- is empowered by their team and their superiors to make final decisions on the given task or project.
- accounts for the group's progress toward their goal - "we have finished x and y, what we need to do now is z".
- decomposes the end goal into tasks, requests that others (both inside and outside the team) assume responsibility for completing those tasks, and negotiates what specifically will be delivered, and when, with the person responsible for that task.
- delegates and/or requests assistance on the execution of the task from inside and outside the team as needed.
While accountability can not be shared, secondary responsibility can be. The accountable individual should be able to rely on her/his team and superiors to:

- assume responsibility for meeting the commitments s/he made on their behalf.
- support and uphold her/his decisions.

**RESPONSIBILITY.** Those responsible to an accountable person are expected to do everything possible to meet their collective commitments. This includes both the tasks they have chosen to accept, and any other assistance they can provide to meet the goal. They are expected to negotiate with the accountable person to establish realistic deadlines and outputs and then to meet those jointly set goals. If a "responsible" person expects to miss a deadline or anticipates being unable to meet the specified requirements of the task, that person is expected to get back to the "accountable" person and re-negotiate deadlines and agreements. Nothing should get dropped.
A. What are requests and promises?

In order for someone accountable for a project to succeed, s/he must ask others to help achieve the objective. The person or people being asked, may or may not promise to do as requested. Should they be able to meet the request, and should they choose to assume responsibility for doing so, they may communicate their commitment by making a promise. However, even when a promise is made, follow-up by the team leader may be necessary to assure compliance.

B. When are they useful?

Requests and promises are useful:

- When an accountable person is trying to determine who will take responsibility for accomplishing a given task.

- When estimating what percent a group can contribute to close the gap between the current state and the identified goal or target in the catch ball process.

- When planning the time and resources necessary to meet a specified objective.

C. How do you make them?

To ensure receiving the specific help required, the person requesting assistance must communicate:

- exactly what needs to be done,
- any relevant specifications or requirements,
- the date it must be completed.
The person or group accepting responsibility for meeting all or part of a request, communicates their acceptance and, may also indicate what they will require to meet the request.

SAMPLE DIALOGUE

Accountable Person = (A), Responsible person = (R)

A  "We've finished compiling the financial information on project AX for the annual report and we've written the first draft of the last two sections, the one on new ventures, and the one on community projects. We still have to edit and proof the copy, get it typeset, find illustrations, and get it all designed and printed. R, can you have a final draft of these last two sections to me by Thursday?"

R  "I can't get it done by Thursday. I could get it done by late in the day Friday, but only if you get me your final comments tomorrow."

A  "OK, So if I get you my comments tomorrow, you'll have the final draft to me by Friday afternoon?"

R  "Yes, I promise."
To Make it Real, Write it Down!

Discussions or negotiations about goals, expectations, targets, tasks, schedules, etc. generally begin with an overview of possibilities and then cycle until they arrive at a point of agreement or clarity. Once that point has been reached, it is important to record what has been agreed to, to preserve the clarity of the moment, and to support fulfilling the commitments. Often what is put in print distinguishes the real or realizable from the possible or imagined. There is an important difference, for example, between discussing who MIGHT be held accountable for producing a product, or when a product MIGHT be delivered, and deciding who WILL to be held accountable for producing the product by a specified date.

KEEP A WRITTEN RECORD OF:

- Agreements
- Conclusions
- Action plans, target dates and commitments (Who, What, When, How)
- Next steps
- Task breakdowns

Writing things down helps clarify and define expectations, plans, goals and agreements. Because it helps clarify, it also increases the likelihood that expectations will be understood and fulfilled.
Writing things down also preserves the specifics:

- WHAT is expected
- of WHOM (a specific person is better than the generic words, "team" or "analyst", for example)
- by WHEN.

This supports individual and collective memory and reinforces commitments. It also helps clarify how a series of outputs combines to produce a collective output, and how the successful or unsuccessful completion of one part of the sequence influences the ability of others in the chain to meet their agreements.
## ACTION PLAN

<table>
<thead>
<tr>
<th>Root Cause:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countermeasure:</td>
<td>Accountable Person:</td>
</tr>
<tr>
<td>Practical Method:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Task</th>
<th>Time / Schedule</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AGENCY OBJECTIVE | DISTRICT OBJECTIVE | INDIVIDUAL PROJECT | PREPARED BY
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As we have noted before, effective team leadership requires an awareness and use of two sets of skills:

- problem-solving skills (task)
- group dynamic skills (people)

Problem solving skills provide a basis for achievement and productivity. Effective team leaders must understand and support the QIC Story as a beginning point or foundation for QI teams.

However, if teams do not function well together, they will fail to reach team goals and objectives. Effective team leaders must be aware of behaviors and be alert to group dynamics in order to be able to understand team interactions. In summary, then, we can say that teams may focus on either of two issues:

<table>
<thead>
<tr>
<th>Team Focus</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>TASK</td>
<td>To get the work objective accomplished (e.g. to complete the QIC Story)</td>
</tr>
<tr>
<td>PEOPLE</td>
<td>To establish effective relationships among members</td>
</tr>
</tbody>
</table>
Effective leaders will be able to recognize and practice behaviors characteristic of both orientations since it is only by combining both an awareness of task and people that teams can accomplish their goals effectively. Graphically, this is represented as a balance between **TASK** and **PEOPLE** as follows:

The charts on the next two pages summarize information on these behaviors.
TEAM TASK BEHAVIOR

Function: Helps the team accomplish its task and achieve its goals.

<table>
<thead>
<tr>
<th>Behavior Category</th>
<th>Behavior Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pointing</strong></td>
<td>Propose tasks or goals.</td>
</tr>
<tr>
<td>Direction</td>
<td>Define a group problem.</td>
</tr>
<tr>
<td></td>
<td>Suggest a procedure, technique or idea.</td>
</tr>
<tr>
<td><strong>Fact or Information Seeking</strong></td>
<td>Request Facts.</td>
</tr>
<tr>
<td></td>
<td>Seek relevant information.</td>
</tr>
<tr>
<td></td>
<td>Ask for expression of feeling or value; seek suggestions or ideas.</td>
</tr>
<tr>
<td><strong>Fact or Information Giving</strong></td>
<td>Offer facts.</td>
</tr>
<tr>
<td></td>
<td>Provide relevant information.</td>
</tr>
<tr>
<td></td>
<td>State belief about group issues.</td>
</tr>
<tr>
<td></td>
<td>Give suggestions or ideas.</td>
</tr>
<tr>
<td><strong>Specifying and Clarifying</strong></td>
<td>Interpret ideas or suggestions.</td>
</tr>
<tr>
<td></td>
<td>Clear up confusions.</td>
</tr>
<tr>
<td></td>
<td>Define terms.</td>
</tr>
<tr>
<td></td>
<td>Indicate alternatives and issues before the group.</td>
</tr>
<tr>
<td><strong>Calling the Question</strong></td>
<td>Pull together related ideas.</td>
</tr>
<tr>
<td></td>
<td>Restate suggestions after group discusses them.</td>
</tr>
<tr>
<td></td>
<td>Offer a decision or conclusion for group to accept or reject.</td>
</tr>
</tbody>
</table>
TEAM PEOPLE BEHAVIOR
Function: Helps team maintain good working relationships, thereby permitting maximum use of member resources and a good climate for task work.

<table>
<thead>
<tr>
<th>Behavior Category</th>
<th>Behavior Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconciling</td>
<td>Attempt to reconcile disagreement; reduce tension. Get members to explore differences.</td>
</tr>
<tr>
<td>Facilitating</td>
<td>Help to keep communication channels open. Get others to participate. Suggest procedures that permit sharing.</td>
</tr>
<tr>
<td>Encouraging</td>
<td>Be friendly, warm and responsive. Use non-verbal communication cues or remarks. Indicating acceptance of contributions.</td>
</tr>
<tr>
<td>Compromising</td>
<td>Offer compromise when own idea or status is involved in a conflict. Admit error. Modify in interest of group cohesion and growth.</td>
</tr>
<tr>
<td>Emotional or Feeling Testing</td>
<td>Test whether team is satisfied with its procedures or suggests alternatives. Point out explicit or implicit norms (e.g. start on time).</td>
</tr>
<tr>
<td>Consensus Testing</td>
<td>Ask to see if group is nearing a decision. Test to see if group is nearing a possible conclusion.</td>
</tr>
</tbody>
</table>
A. **What is a Management Presentation?**

A Management Presentation is an opportunity for the team to describe its [QIC Story](#) to management in order to solicit understanding, support and approval.

B. **Why is it useful?**

Aside from gaining approval for implementation of countermeasures, the management presentation is a golden opportunity for the team to personally experience, as a whole, all that it has done, and to gain recognition for its activities and accomplishments.

C. **How is it done?**

In the [QIC Story](#), be sure that: 1) the theme is clearly stated on the cover page, 2) all words and graphs are legible, 3) all terms are defined, and 4) the checkpoints are all satisfied.

The team briefly recounts its use of the process. The data gathered are illustrated using the [QIC Story](#) format. The team organizes its presentation to show the logic, flow and consistency of the project. Teams need to consult the [QIC Story Review Form](#) to ensure that each checkpoint is addressed. Once this is complete, the team prepares and rehearses its presentation, incorporating effective presentation and communication skills.
D. **When is it used?**

This depends upon the department or area. However, a rule of thumb is for the teams to make a management presentation at Steps 2, 4 and 7 of the **QIC Story**. The presentation at Step 2 is to assure that the team has stratified the data and focused properly to avoid working on "world hunger". The Step 4 review is to secure the approval to implement the countermeasures usually in a test area. After Step 7, it is time to review the effects (results) and standardization and to **celebrate** success by recognizing the team.

---

**Reviewing QIC Stories**

The method of learning to use logic and techniques to tell the **QIC Story** is to practice reviewing and critiquing examples.

When preparing a **QIC Story** or when reviewing a **QIC Story**, especially when you may not be familiar with the technical content, look at three areas:

---

**LOGIC + FLOW + CONSISTENCY = EFFECTIVE QIC STORY**
LOGIC

Ask questions relating to content.

- "Does the story make sense?"
- "Does it follow process and use QC tools or techniques correctly?"
- "Are the checkpoints of the QIC Story Review Form met partially, fully or not at all?" (Checkpoint compliance can be illustrated by showing ✓1 , ✓2 , etc. on the QIC Story itself.

FLOW

Check the format to see if the QIC Story is easy to read, follow and understand.

- "Are there links relating the process steps, objectives and checkpoints?"
  - An opening telling why an investigation is being performed.
  - A graphic display of data with a meaningful title.
  - A summary of the data highlighted, such as "findings."
  - Finally, objective conclusion(s) turning the data into useful information and leading to the next question or process step.
- "Are linking mechanisms used to help the flow and keep the reader's eyes focused on important points?"
  - QIC Story layout with headings.
  - Arrows (to indicate logical transitions).
  - Clouds (to indicate areas of emphasis).
  - Hash marks.
  - Page numbers, etc.
CONSISTENCY

Look for agreement or harmony in both content and format, relating each process to one another and to the overall QIC Story.

- Terminology
  Example: Purchasing Form, Requisition, Order, Purchase Order.
  If these are meant to be one and the same, then the same term should be repeated.

- Drawing of graphs, charts, matrixes, etc.
A. Purpose

The purpose of recognition is to formally acknowledge the accomplishments of teams or team related activities.

B. Aspects of Recognition

Two major forces help drive Quality Improvement. These are:

- Personal satisfaction from participation in the process and the knowledge that you can make constructive changes in your work environment which help meet the needs of the customer.
- External recognition which honors those who contribute to quality improvement.

C. Considerations

Recognition is mean to be a "Win-Win" situation, but it is often difficult to implement in a way that everyone perceives it as such. *Teams should recognize that successful long-term recognition is most applicable on a local level.* Peer recognition and recognition by your local management have a more direct, lasting impact.
D. Basic Rules

- Sincere
  - Tone of voice is consistent with verbal message being conveyed.
- Personalized
  - Meaningful personal interaction between the giver and receiver.
- Accurate
  - Giving credit where credit is due.
- Timely
  - Effective recognition follows its target behavior closely in time.
- Specific
  - Provide information on the particular aspects of performance that made it outstanding and deserving of recognition.
- Situationally Appropriate
  - Giver is consistent in her/his interpersonal style.
  - Form of recognition is suitable for the occasion and the recipient.

E. Types of Recognition

- Tangible versus intangible recognition.
  - What is the magnitude of the accomplishment? (Tangible is more suitable for "larger" accomplishments.)
  - What is valued by the receiver? Would the recognition have a greater impact in a tangible form or would intangible means, such as increased responsibility, be more suitable?
• Formal versus informal recognition.
  • What is the magnitude of the accomplishment?
  • What is the availability of formal channels, (i.e., scheduled recognition event or award dinner).
• Public versus private recognition.
  • Giver's comfort level.
  • Receiver's comfort level.
  • Peer environment.

Public recognition is a vehicle for making the organization more effective by calling others' attention to those behaviors and attitudes which are making positive contributions. Thus, a decision to recognize publicly is based on the expectation that there is increased motivational value to both the receiver and the audience.
Overview

A team leader will instruct team members in the QIC Story and its techniques. In order to "help team members learn," the team leader must remember the special needs they have as adults. From Figure 1 on what we absorb or retain, you will see why we emphasized practical experience in this course. This emphasis is recommended when teaching the team.

The team members have learning needs that are really no different from your own. Think back to the best and/or worst adult learning experience you had as a participant.

Exercise

Group A
Think for a moment of the BEST adult learning experience you ever had. What made it so good? List the characteristics and behaviors of that good learning experience.

Group B
Think for a moment of the WORST adult learning experience you ever had. What made it so bad? List some of the characteristics and behaviors of that bad learning experience.
<table>
<thead>
<tr>
<th>BEST:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WORST:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
WHAT DO ADULTS ABSORB?

- 10% of what we **read**
- 20% of what we **hear**
- 30% of what we **read and hear**
- 50% of what we **hear and see**
- 70% of what we **say**
- 90% of what we **do**
PRINCIPLES OF ADULT LEARNING

1. **Adults learn best by solving realistic problems.** Adults are interested in learning how to cope with the problems they face NOW. Therefore, learning should be practical. For example, if you run a session on brainstorming, you should let the group try it on a real problem.

2. **Adults learn best by doing.** Listening and watching are fine, but putting the knowledge to use is the real learning. Therefore, build opportunities for involvement and participation into your sessions. Remember, learning is an active process.

3. **Adult learning is a complex process involving the whole person.** Explain why. What is in this for them? Why should they want to improve their skills in problem-solving?

4. **Adults learn best in informal situations with mutual respect between trainers and learners.** A good learning environment is crucial. An informal, non-evaluative climate will help bring about the high involvement needed for learning.

5. **Adults learn best when they have a role in planning their own learning.** Make the planning of your team’s training a group decision. The team may also begin to identify other types of training needs, (e.g., technical).

In the final analysis, all adult learning is self-learning. You can not really teach a person anything, you can only help people to learn for themselves.
As was mentioned earlier, among the many duties of the Team Leader, one of the most important is responsibility for the ongoing training and updating of Team Members in the QIC Story and techniques. This is often done with the help/assistance of the facilitator or Quality Coordinator.

- The first and most important way you do this is by *modeling*; that is, knowing the QIC Story and techniques and by applying them.
- The second method is by *teaching* them to others.

It is not possible to make you into an experienced trainer in a short time, but you can at least become aware of some of the behaviors that will make your training interaction with team members more effective. You have already shown leadership potential; that is why your management is spending the resources to train you during this course. You will exercise that potential best when you are most natural and build upon your own best qualities. It is these which will be reinforced in your teaching opportunity here in the course.

In the pages which follow, we will:

- show you how the P-D-C-A model can be applied to training.
- introduce you to the use of the Team Member Manual and this manual as a training tool.
P-D-C-A- AND TRAINING

Although we are leaving the details of how to teach to you, we recommend the following process which is basically P-D-C-A:

**PLAN:** Prepare yourself by reading the Team Member Manual, which is the same as Units 1 through 5, 8 and 9 of this manual. Familiarize yourself with its content and flow. The two manuals contain two kinds of material: explanations of the **QIC Story** (both steps and QC tools and techniques), and some group dynamic exercises.

After familiarizing yourself with the particular materials you want to teach, prepare what you will want to use at the team meeting.
- Have any extra examples copied as handouts.
- Have a tape player if you are using videotapes.
- Use overhead transparencies or flip charts that are clear and as simple as possible.

**DO:** Teach the technique using the **Introduction-Example-Practice** model which is explained on the following pages.
**CHECK:** How did the exercise go? Are they now able to apply what was covered? Get feedback from the team members. How do they feel about what they did? Can they give an example of where they might use the technique?

**ACT:** Make adjustments in their understanding. Slow down with a team that is struggling; speed up with one that is on target; repeat; clarify; use other examples. Finally, get them to apply what they have done to their own situation.
A. What is the Team Member Manual?

The Team Member Manual is designed to help team members learn the QIC Story, the QC Tools and techniques by using them in problem-solving. It is identical to Units 1 through 5, 8 and 9 of this manual.

B. Why is it useful?

We use the manual for two reasons:

- To help new team members learn the QIC Story, the QC tools and the techniques.
- To update or refresh old team members.

C. How is it used?

Follow the Introduction-Example-Practice model:

- **Introduction**: Introduce them to the concept or tool and explain it; use the material in the manual as your guide.

- **Example**: Give them an Example. You may use the one given in the text, but it is a better idea to choose an example from their own work.

- **Practice**: Get them to Practice applying it.
EXAMPLE: FISHBONE ANALYSIS

INTRODUCTION: Explain to them what Fishbone Analysis is, why we use it and how we use it. Use the Team Member Manual as a guide.

EXAMPLE: Walk them through the example given in the Team Member Manual.

PRACTICE: Get them to do a practice exercise.

D. When do we use it?

When training or updating team members.

EXERCISE

Subject: 

Team Number: 

Prepare a five-minute presentation on the subject you have chosen.

You will only present to your team.

Prepare your flipchart(s).
Unit 7

Group Dynamics
The focus for Group Dynamics is on the predictable stages and behaviors that teams go through. Understanding these will help us deal with how we can influence team effectiveness.

Upon completion of this unit you will be able to:

1. Understand the **basic needs and expectations** of team members (and human beings, in general).

2. Understand the various ways teams can work together to arrive at "accepted" decisions.

3. Understand the **communications**, **listening**, and **coaching** issues that a Team Leader must deal with.

4. Understand the four stages of Group Development and how to deal with potential **problem behaviors**.
TEAMS

1. Teams are simply people working together toward a common goal.

2. If teams are to be successful in achieving their goals (tasks), they must also be successful at working together (group dynamics). In order to be productive, people have certain needs and expectations for:
   - physical safety,
   - psychological security,
   - shared responsibility,
   - respect and
   - the chance to exercise initiative.

3. Effective personal interactions among team members do not just happen; they must be planned and checked. This happens more effectively through the understanding and guidance of trained team leaders. It is the duty of the team leader not simply to understand and know the steps and techniques necessary for the QIC Story, but also to understand what team members need in order to work together effectively. We can summarize some of these concerns as follows:
   - Team members need to know WHAT they are supposed to do; i.e., What is the team purpose?
   - Team members need to know WHO they are and WHO will support them; e.g., What is my role as team member? What are the roles of mgmt / supervision / facilitation? What will happen if problems arise?
Team Member Expectations

- Team members need to know **HOW** they will proceed; the **Purpose** of the meetings, **Agendas**, time **Limits**.
- Team members need to know **WHY** they are together; that is, **WHAT's in it for them**, what **benefits** can they expect? This is probably the **most important question** to answer for them or they may not even hear the answers to the other questions!

**SUMMARY**

Effective team leaders should know and be able to communicate answers to these basic questions:
There are three basic ways to make decisions: A **monarchy**, where one person makes all the decisions, a **democracy** where the population makes the decisions by voting, and then there is **consensus** where decisions are made based on uniform agreement. While voting is a way for many people to become involved in a decision in a relatively fast manner, it is a win-lose situation. The majority wins and the minority loses. Consensus, on the other hand, derives decisions only when all members agree first. Webster's New World Dictionary defines consensus as the voluntary giving of consent.

Does this mean that all members must have the same level of enthusiasm for the idea? No. It simply means that a member can at least live with the decision and would not disrupt the plan if they had the opportunity to do so.

This sounds great, but like most things, consensus does have its downside. It is very time-consuming to make decisions this way, since all members are obligated to participate in sharing their views on the subject at-hand. The benefit is that the subject is thus very well explored and totally understood by those discussing it. This surfaces an important aspect of consensus. If any member is not adequately involved in the discussion, then the whole group may miss a very important piece of information it needs in order to make the best decision.
It is this element of consensus that makes it such a powerful decision-making technique. Specifically, that all members not only get a chance to participate, but that they are obligated to do so. Consensus usually derives the best decision because it builds on the combined knowledge of the participants.

All of these useful decision-making methods (voting, consensus and even unilateral decisions) have their place. It is up to the leader to set the stage and call for the proper tool at the proper time.

**Key Guidelines For Decision Making By Consensus**

Avoid arguing based on opinion. Strive to focus on facts and objectivity. Don't change your mind to avoid conflict. Change it based on facts and objectivity. Look at differences among the group as positive ways to make change. Coach each other to be honest, open and data based as much as possible.

The following is an exercise to practice the decision-making technique of consensus in a group setting. Pay special attention to member involvement as this will drive your success.
Characteristics

- Everyone agrees.
- They fail to communicate their agreement.
- They wind up taking actions that result in the opposite of what is desired.

Results

- Anger
- Frustration
- A search for a scapegoat...

Causes

Elaborate negative fantasies; Exaggerated risk.
Action Anxiety: A fear of taking the related risk...a fear of being ostracized or separated or seen as being a non-team player...so we choose to pursue a course of action we know is hopeless...all passengers on the Abilene Express conspire together.
The Abilene By-Pass:

We must know the road signs to avoid an unwanted trip. Confront the situation with which everyone already agrees on...approach cautiously and diplomatically.

Consider the real risks. Consider the benefits of standing up for what you honestly feel is right.
Communication Process

Without understanding, message is just noise.
Leadership/Group Dynamics
The success of any project depends on how well it is communicated to anyone likely to be affected by or interested in its activities. For example, when a team is working on a project to reduce the food stamp error rate, it needs to collect data to document the current error rate. Before they begin collecting data they need to notify all supervisors and workers to explain why, how and when the data will be collected. If they do not explain what they are doing beforehand, their actions are likely to be misunderstood and people are likely to be fearful and resistant to sharing the information.

What Is Effective Communications?
Communications is the ability to transmit and receive accurate information, ideas, or concepts from a sender to a receiver. Effective communications is the ability to manage the complexity of the communications process to insure accuracy.
Conditions Which Hinder Effective Communications

- Emotional blocks
- External noise in the environment
- Defensiveness
- Hidden agendas
- Hostility
- Past experiences
- Preoccupation
- Speaking for others
- Stereotyping
- Strong personal beliefs

Conditions Which Help Effective Communications

- Active listening
- Active understanding
- Caring
- Focus on the person
- Honesty
- Interest
- Open mindedness
- Paraphrasing
- Proper environment to communicate
- Respect
- Separating facts and data from inferences
- Speaking for self (I versus we)
Developing A Climate For Effective Communication

The climate of a group affects the ability of group members to work well together. One way to conceptualize the influence of group climate is diagramed below:

These kinds of behavior | Produce this kind of climate | Which results in these kinds of responses
---|---|---
CONTROLLING | CONFORMING |
PUNISHING | RESENTING |
REGULATING | DEPENDING |
TELLING | DEFENSIVE | AVOIDING INITIATIVE
SHAMING | HIDING AND DENYING |
GUILT-PRODUCING | APATHY AND DEPRESSION |
JUDGING | DECEPTION |
LISTENING | EXPERIMENTING |
UNDERSTANDING | CREATING |
TRUSTING | EXPOSING |
SHARING | AUTONOMY |
CLARIFYING | PARTICIPATING |
REWARDING | PRODUCING |
WHERE EFFECTIVE COMMUNICATION BEGINS

Active Listening

One of the most important communication skills is the ability to listen and understand. If we are not able to accurately understand the message being sent by another the whole communications process breaks down.

Active listening is a process of accurately hearing the total message, including words and feelings. It is not necessarily agreement.

Empathy: the ability to identify the other's feelings; the ability to understand the other's view of reality even though it is different from our own and the feelings we have are not the same.

Acceptance: the ability to accept the other's position as being true for them, whether or not we are in agreement.

Restate words and describe feelings of the sender to check understanding.

Selective Listening

Listen for and choose relevant information to use as a basis for additional questions.
Responsive Listening

Acknowledge relevant information to encourage further comments.

- Smile
- Head nod
- Eye contact
- Do not interrupt
- Possibly take notes
- Watch speed and tone of your voice
- Use words like "right", "sure", "really", or "that's interesting".

Make sure your understanding of the situation matches the other person's understanding.

Active Understanding

Active understanding is the process of testing your understanding of what is being said with the speaker. In terms of the PDCA quality process, active understanding applies the "check" function to communication by checking or testing your understanding against what the speaker intended to communicate. One way to test your understanding is to paraphrase. For example, if someone is explaining the specifications of a specific customer requirement, you might test your understanding by saying "let me see if I understand what you are saying. Do you mean ..." and then repeating, in your own words what you understood him/her to be saying to you.
Paraphrasing allows the other person to affirm or to correct the accuracy of your understanding.

**Separating Fact/Data From Interpretation**

One skill which greatly improves the odds that what is being "sent" will eventually be "received" or understood, is the ability to distinguish and to separate fact and data from inferences and conclusions. All of us jump to conclusions. We have to make sense of the volumes of information that we process in any given moment. The sense making process almost always begins with some form of fact or data; a sentence or a word, non-verbal behavior, statistics, written policies, a sequence of events. We scan our environment, select bits of information to pay attention to, and then combine them, making "sense" out of them.

Difficulties begin when we assume that the "sense" we make is the only sense that can be made, when we confuse facts with our interpretation of them. Different people may interpret the same data differently, and may not be aware that they are doing so. In order to be able to compare interpretations, you need to link the interpretation with the fact or data it originated from.
The ladder of inference is a tool or conceptual device that helps represent the inferential steps people take from fact to interpretation. The first rung of the ladder is observable data, the actual words someone said, the concrete action that was taken.

For example: John, Bill's supervisor, walked into the room, sat down in a chair cleared his throat and said "Bill, I am concerned. What is going on here? The quality of your work has really deteriorated in the last two months." Those are the "facts".

The second rung of the ladder contains the cultural meaning of the data, the meaning that most others in the same language or cultural community would derive from the behavior. So, in this instance the cultural meaning of what John said is "I am dissatisfied with the quality of your work, and I want to know what is causing it".
The third rung of the ladder is the meaning imposed by the listener so it might be "John is furious with Bill and is thinking of firing him" or "John cares about Bill and wants to help him improve his performance."

### LADDER OF INFERENCE

<table>
<thead>
<tr>
<th>3</th>
<th>John is furious with Bill, will fire him</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>John cares about Bill, wants to help</td>
</tr>
<tr>
<td>2</td>
<td>&quot;I'm dissatisfied with your work&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;I want to know why the quality is down?&quot;</td>
</tr>
<tr>
<td>1</td>
<td>&quot;Bill I'm concerned, What's going on here...&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;The quality of your work has deteriorated&quot;</td>
</tr>
</tbody>
</table>

### LISTENER'S INTERPRETATION

### CULTURAL MEANING

### DATA/FACTS

### Why Is It Important?

Many conflicts and misunderstandings are caused by the blurring of fact and interpretation. If, for example John wants to help Bill, but Bill decides that John means to fire him, he will likely begin defending himself and quickly become angry. By separating fact from interpretation, Bill has another option.
He can begin by testing his understanding of the facts with a paraphrase or cultural meaning by saying something like "you think my work is not as good as it used to be?" If John responds "yes", Bill could then test his interpretation "are you thinking of firing me because of that?" And could find out whether what he inferred was true.

Facts exist outside of us. Interpretations are what we make of facts. They exist inside us and are our creation and are often the source of our emotional responses. Bill, in the example above, will have a very different emotional response and will, therefore, react very differently depending on the interpretation he creates.

**When Is It Useful?**

It is useful when listening as a coach to someone telling you about a problem incident. Distinguishing between what actually happened and the sense they made of the facts can help you understand how they are seeing the incident and create possibilities for re-framing it. Also, concentrating on fact enables the coach to show the "player" how the facts of his/her behavior might be interpreted.

When engaging in a conflict, returning to the facts and comparing both parties interpretations can clarify what is a disagreement of principal and what is a difference in interpretation.

When testing a judgement or conclusion, providing both facts and interpretation can help others evaluate and fill in gaps in your logic.
Practice communication skills associated with separating fact/data from inference.

- Break into groups of two.
- Read the dialogues assigned.
- Discuss each one with your partner.
- Decide what is fact and what is inference.
- Discuss pitfalls and implications of blurring facts with inferences.
- Jointly create a new dialogue for each sample where fact and interpretation are separated and tested separately.
- Be prepared to discuss your results with the class.

- 30 minutes.
Communication Skills Exercise

Exercise On Separating Fact/Data From Interpretation

1. A. "You know Fred, the boss has not been in for three weeks and she has missed the last three project meetings. She just does not care how things are going."
   B. Fred - "I think she has already decided the project is going to fail and is pulling out while she still can. This way she can say that she has not been involved in the mistakes of the past few weeks."

2. A. "Jane just does not want to take any responsibility for this project. I tell her we have to cut cost and speed up the schedule and all she can say is 'I can not do that. My people are overworked as it is.' She just got three new people last month and I have not heard that they took on more work. I will bet she is just trying to grow her division to get more power for herself."
   B. "She sure is a wimpy whiner. Does she know that if we do not meet these requirements they will go elsewhere? She probably already has another job."

3. A. "The secretaries went home again without finishing the project. They are really lazy. We just gave them eight more pages, that is not a lot."
   B. "What do they get paid for anyway? I went in yesterday and found one on the phone with her boyfriend. They never do any work. Just talk on the phone."
UNIT 7

7-20

Stages of Group Development

Overview
When small groups of people come together for the first time or when other
events occur, these groups are said to be in transition and will undergo some
predictable phases of team change or growth. A corresponding change in
individual comfort levels brings tension and a sense of uneasiness to the
whole team.

The net result is usually some form of undesired or dysfunctional team
behaviors. An awareness of these stages of group development and their
related behaviors is important, especially for people leading teams in
transition. The transition can be triggered by numerous events, including:

- A small group coming together for the first time.
- Changing team leaders on an existing team.
- Member turnover.
- An unexpected surprise visitor sits in with the team.

All of these things (and others not listed), affect how people in teams feel,
how they behave, what they say, and how they say it. For example, try and
recall how you felt on the first morning of this workshop. Has anything
changed since then in the way the group interacts with each other and the
ability to accomplish the tasks at hand?

Initially, there may have been some hesitancy to participate and less
willingness to volunteer. Some people would prefer to hide if they could,
rather than be called upon to come up and address the group. Remember
those feelings on the afternoon of day three.
During the interim you will individually and as a group, experience the stages of group development first hand.

**Here Are The Stages of Group Development**

**Stage I Form:** This is where the group comes together either for the first time or after being apart for long periods.

During this phase, team members discover what behaviors are acceptable. A transition from being an individual to being a member occurs here. This is a period of **testing** behavior and **dependence** on formal leadership for guidance. Individuals are unsure of themselves in the new environment and usually act reserved.

**Typical behaviors of stage I:** People attempt to describe objectives and decide how the team will accomplish the work. Such as the type of data to collect.

Often there is a hesitancy to participate.

---

*Tuckman (1965)*
Some members will test the leader's behavioral expectations and ways s/he will address problems.

Feelings of desired attachment to the team can occur.

Intellectualizing.

Discussing symptoms peripheral to the work.

Complaints about the organization.

Doubts, concern and anxiety about the new environment.

Minimal work gets done.

**Stage II Storm:** This phase is characterized by *intra-team conflict* as members become more familiar and more comfortable with the team environment. They take more risks, and often begin to become competitive with each other.

People begin to see scope of the task and what is expected of them. They may respond emotionally to the commitments they must make. Members can become belligerent or overzealous as a means of expressing individuality and resisting identity loss and self-denial.
Typical behaviors of stage II: Defensive behavior, conflicts and competition.

Setting unreachable goals.

Tension, jealousy, lack of harmony or discord.

Resisting assignments because they seem to interfere with personal desires.

Concerns over excessive work.

Polarization of team members.

The establishment of an informal hierarchy or pecking order.

Minimal work is accomplished.

Stage III Norm: This phase is typified by the development of team cohesion. After all the conflict of phase II, the members begin to recognize and accept the team norms, their roles and the pecking order established in stage II. The personal "quirks" of other members also become accepted, or at least better tolerated, and torn relationships get patched back up.
Typical behaviors of stage III: Now people work at avoiding conflicts.

Members take each other into more confidence.

A common spirit emerges and a sense of TEAM begins to exist.

The group establishes their "turf" and derives a sense of mutual ownership for protecting the boundaries.

A fair amount of work is accomplished.

Stage IV Perform: This is when the team really begins to operate smoothly like a well oiled machine. Members now know one another well, they freely depend on each other for support and can thus focus on solving the problem and objective decision making instead of each other.

Typical behaviors of stage IV: The team gains insight into the problem solving process.

Voluntary self-improvement is undertaken.

A great deal of work is accomplished.
What Does This Mean To You?
Because the Form, Storm and Norm stages of group development result in less than optimum output, teams often try and push through these phases before their chemistry is ready to move on in order to improve team productivity.

This might seem like a good idea, but it is really dysfunctional.

It is natural for people to go through predictable phases of growth depending on maturity, experience, and other factors. It is natural for teams to do so too. They must go through these predictable phases as they mature and gain experience with each other and the QIC Story.

The duration of each phase depends on individual and team maturity, task complexity, leadership, and the sponsor's support.

While it is natural that teams go through these stages some teams can get stuck in different stages. Given that the stages are unavoidable, an idea to consider to help reduce the time needed for a "team in transition" to go through the stages and be fully productive, is to share expectations about the group and its preferences and direction.

Specifically, the team can establish (as part of their rules of team conduct) for example, there will be no "surprises". This can help establish an atmosphere of trust earlier in the evolutionary process allowing for some interpersonal issues to be put aside so people can focus on team objectives.
FORM STAGE
Members wonder why the group has been established and what role they are expected to play. People talk about what the task is. Discomfort arises from not knowing who should clarify the task. People test each other, trying to figure out motives and hidden agenda.
- Task Issues included establishment of goals, objectives, and priorities. The group clarifies its purpose for meeting, describes its end project, determines a course of action and decides on procedures.
- Personal Issues include how much energy members are willing to give the group, and how much they are willing to be influenced by the group. Curiosity about other members is high.
- Leadership Strategies
  - breaking the ice and
  - active participation.

STORM STAGE
Issues center on power and influence as members wrestle with questions of control. People disagree about issues and how to approach them. This is the stage where people work through a method for operating. People may be in conflict over the roles members have assumed.
• **Task Issues** involve roles and responsibilities as members structure tasks and assign duties.

• **Personal Issues** center on control, with leadership shifting as members decide how much control or influence they want over the group, and how much control or influence the group has over them.

• **Leadership Strategies**
  • dealing with differences
  • managing emotions

**NORM AND PERFORM STAGES**

These stages are characterized by openness and team spirit. These are the most cohesive stages, because the group begins to work as a single unit, which usually results in greater productivity. People share information and disagree constructively. People accept each other and roles are interchangeable with little disruption to the group.

• **Task Issues** involve feedback, following through to be certain people have executed their responsibilities, following up to make sure that things were done right, and keeping track of results.

• **Personal Issues** include emotional support, such as how much help, reinforcement and constructive feedback members give and receive.

• **Leadership Strategies**
  • follow-up and follow-through
  • feedback
  • building team spirit
# Stages of Group Development

## Form
- What am I doing?
- Who are these people?
- Who is in charge?

## Storm
- How effective am I?
- How much influence do I have?

## Norm or Perform
- I know how I belong
- I know what I contribute

### Individual Issues
- What is the charter?
- Is this the right group?
- Is this the right structure?

### Group Issues
- How do we work together?
- What is each member responsible for?
- What should we be working on?

### What You Will See
- Testing boundaries
- Establishing rules
- Caution
- Politeness
- Superficiality
- Dependency/Counter Dependency

- Focus on methods
- Conflict/tension
- Cop out (quick agreement and silence)
- Polarization
- Resistance
- Win-Lose

- Increased comfort
- Role shifting
- Little need to discuss methods
- Identification with the group
- Shared power and information
- Fun

### Leadership Strategies
- Break the ice!
- Get involved and participation

- Elicit examination of differences
- Model and support influential, not aggressive communication

- Provide positive and critical feedback
- Create celebration
WHAT IS COACHING?

In sports, the players make goals, pass the puck, hit the ball and run between the bases in an effort to win the game. The coach is also actively committed and essential to the players' and the team's success. Observing from the sidelines, the coach sees things that the players, who are absorbed in immediate action, cannot see. Coaches use their expert knowledge of the game to help them pinpoint what is and is not working, and to generate more effective actions. After, and sometimes during, the game, coaches share their perspective with the players and make recommendations designed to help the players improve their game.

In contrast to sports, coaching relationships at work can exist between peers as well as between an individual and the boss. Unlike the person who is responsible for executing a given task, for being directly "in" the action, the coach's role is to take a larger and more distanced view of the action and then, by providing another perspective on the situation, help the "player" see new options and improve his or her day to day job performance.

WHY IS IT USEFUL?

Coaching is useful because it provides a broader, more objective perspective on events and actions, it provides opportunities to learn different skills and to develop individual competence.
WHEN IS IT DONE?
A. When an individual is struggling with a challenging assignment.
B. When a person is performing a task and the coach believes there are more effective ways to do it.
C. When someone wants feedback or assistance to improve their skills.
D. When someone needs help clarifying their thinking or wants feedback on their ideas.
E. When the person who is accountable for the success of a project engages in make or break tasks.

HOW IS IT DONE?
1. Establish the performance area for development and why it is important. Begin by establishing what is of interest or concern to the person being coached, or by describing the area the coach recommends for improvement. Highlighting one area for discussion helps focus the coaching session, and the "player's" efforts at improvement on one key area at a time. In order for learning to occur, the "player" must be interested in learning. Establishing the importance of the area may increase the player's motivation to learn.

2. Determine the type of coaching that will occur. The "player" might ask the coach to further identify accomplishments and areas for improvement, to observe him/her in action and provide an additional perspective in the moment or in a later debriefing session to engage in mutual problem solving, assist in planning, etc. The player and coach should mutually agree on the arenas and topics around which coaching will occur.
3. **Engage the 'player' in an assessment of the situation and a discussion about their current ideas or abilities to manage it.** Ask open ended questions, e.g. "What is your view of this situation?", or "How do you plan to handle this?" This gives the coach first hand information about the 'players' perspective which helps in building rapport and in establishing the starting point for coaching. Beginning where the "player" is, focuses on enhancing the "player's" abilities, and strategies and helps the coach avoid inappropriately imposing his/her point of view, which often inhibits learning. Starting with the "player's" perspective also communicates respect for their abilities to meet the challenge of the situation and reinforces their responsibility for doing so. It assumes sufficient trust to allow the player to be candid about his/her needs, ideas and abilities.

4. **Give feedback on the `player's' ideas and add new ones.** By providing candid feedback on the player's ideas, the coach recognizes the intrinsic value of the `player's' ideas. Workable ideas should be supported and recognized. When ideas seem incomplete or unsound, the coach can express his/her view, explain how he/she reached this conclusion, and test this perspective with the player. This will help the player understand the coach's logic and allow the player to either agree and alter his/her behavior accordingly, or disagree and supply the coach with missing information that explains the player's choice. The coach can also add ideas, providing new options for the player to consider. The coach must keep in mind that it is the player who must execute the suggestion and that it, therefore, must "work" for the player and be something he/she feels able or willing to do.
5. **Summarize key points, next steps, agreements and commitments.**
   Express confidence and support. By summarizing his/her understanding of the conclusions reached in the coaching session, the coach helps the player, review and clarify how and where he/she intends to apply what was learned and the outcome the player will use to evaluate the effectiveness of the action plan.

If the coaching session:
- is built on the player's understanding of the situation
- addressed the player's coaches
- generated solutions tailored to the player's skills and abilities
- acknowledged and supported the player's strengths in the situation...

Then it is likely that both coach and player will be confident in the player's ability to execute the proposed next steps. Expressing confidence in the player's ability and sharing the reason why s/he is confident, further motivates the player to attempt the suggested actions. The coach might also offer to be available for further help, outline ways s/he might be of further help in the near future, set a time to follow up on the outcome of the next steps.
The ABC's of Coaching Guidelines

There are several guidelines that define coaching relationships.

A. The player and coach must focus on achieving the same result (goal).
B. The player must want to be coached in pursuit of that goal.
C. Because the coach needs to be able to say things that the player might find challenging or critical, the player must:
   • have confidence in the coach's abilities
   • believe that the coach shares the same goals
   • must be open to considering the coach's suggestions.

AN EFFECTIVE COACH:

• Keeps it simple - focuses on one or two issues at a time.
• Listens to understand issues from the player's perspective.
• Distinguishes facts from the player's interpretations.
• Gives specific, behavioral feedback.
• Asks good questions - open-ended, probing, closed-ended.
• Is committed to the player's success.
• Is empathetic and able to acknowledge/reflect the player's feelings.

A. Assumes:

• The person being coached wants to be as effective as possible.
• That the person being coached usually has a reason for what s/he is doing.
• That it is as important for the person being coached to be aware of successes and strengths as of areas for improvement.
That ineffective action may be due to:
- lack of understanding
- lack of knowledge
- a different perspective, so that the person may not see what the coach can see.

That coaching is a process, not an event, a partnership not an assignment. Change and key learning take time and require trust to develop. Coaches often change their perspective as a result of coaching.

That the player's commitments and concerns should determine the content of the coaching.

B. Has a clear coaching contract

A clear coaching contract:
- Outlines the specific focus of the coaching, e.g. managing meetings
- Details how and when the coaching will occur and where it will not occur - e.g. the coach will sit in on the meetings and then debrief and plan with the player after each meeting. S/he will not give feedback while the meeting is taking place.

C. Provides Feedback

In order to give constructive feedback the coach needs to:
- Observe the person's behavior.
- Evaluate what is or is not effective about it.
- Feedback - specifically on what s/he is doing that is or is not
effective, suggest or demonstrate alternate actions.

- Encourage by giving positive feedback and by noting improvements when they occur.
- Shift perspective - see the situation from the player's point of view and then help them re-frame it and see it from another perspective.

D. Ask/Say:

- "Let's take a look at your plans for how to get the product out by the deadline."
- "What would you like to accomplish in this coaching session? What kind of help would you like? How do you think that coaching on this issue will help you?"
- "What happened?" or "What do you think is going to happen? What led you to think that?"
- "What are your reactions or feelings about that?"
- "What techniques or strategies might you try to address this problem?"

E. Ask Him/Herself:

- "Is the person I have been coaching leaving this conversation more able to do something they want/need to do than when we started?"
- "What do I think they learned?"
- "How can I find out if they did learn it (what behavior or action should they now be able to produce)?"
To begin practicing effective coaching.

**AGENDA**

- The instructor will divide participants into groups of three.
- Each group of three will identify, among themselves:
  - A coach
  - A person to be coached
  - An observer
- The person to be coached will describe a present situation in their Team Leader duties, for which they could benefit from some coaching.
- The coach will attempt to provide that coaching, using the Coaching guidelines on the preceding pages.
- The observer will provide feedback on what s/he sees.

**LIMIT**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 minutes</td>
<td>Divide into teams and assign roles.</td>
</tr>
<tr>
<td>5 minutes</td>
<td>Describe situations to be &quot;coached&quot;.</td>
</tr>
<tr>
<td>10 minutes</td>
<td>Coaching takes place.</td>
</tr>
<tr>
<td>10 minutes</td>
<td>Feedback from observer.</td>
</tr>
</tbody>
</table>
UNIT 7

Conflict Management

A. What is Conflict Management?

Conflict is the result of differences, not the cause of them. Conflicts are inevitable in groups. Good interpersonal skills will help you manage the conflict, within your team as well as in your day-to-day living.

B. When do we use it?

Conflict management is an appropriate tool when the team or individual team members reach a point of disagreement or discord, when a decision(s) cannot be made, when the quality improvement process comes to a standstill, and the team's productivity is halted.

C. Conflict is Constructive when it:

- Opens up issues of importance, resulting in their clarification.
- Increases the involvement of individuals in issues of importance and allows individuals to measure their strength and power.
- Measures importance of ideas and issues to team members.
- Makes the team redefine the problem, change its goals, or the method for obtaining its goal.
- Serves as a release for pent-up emotion, anxiety and stress.
- Diffuses what might be a more serious problem.
- Helps team cohesiveness by sharing the conflict, celebrating its settlement, and learning more about each other.
- Results in the solution of problems.
- Propels the team to make a greater effort to reach its goal in the best way.
D. **Conflict is Destructive when it:**

- Diverts energy from more important activities and issues.
- Destroys the morale of people or reinforces poor self-concepts.
- Destroys the cohesiveness of the team and leads to tension between team members.
- Deepens differences in values.
- Causes the team to be unable to make decisions.
- Produces irresponsible and regrettable behavior such as name calling, finger pointing, and fighting.
- Causes individuals to drop out or be reluctant to contribute to the team effort.
- Takes up time needed to complete the team task.
- When there is inter-team conflict, it polarizes the teams so that it increases internal team cohesiveness and reduces *interteam* cooperation.

E. **Why do we use it?**

Conflict Management will help you find practical steps to reach agreement with others, and help you implement your quality improvement ideas. Conflict Management skills support the problem solving process, whether you are dealing with internal or external customers.
F. How do we use it?

Basic Steps to Manage Conflict:

- Recognize that conflict is inevitable and can be constructive.
- Acknowledge within the team that a conflict exists.
- Diagnose the conflict, clarify the problem(s), and be sure all members agree to the diagnosis.

Answer these two questions:

- What is the nature of the difference?
  - Is it about:
    - Goals \ Factual Conflicts?
    - Fact /
    - Methods \ Judgmental Conflicts?
    - Values /

- What is the reason for the difference?
  - Is it about:
    - Information
    - Perception
    - Roles

- Break down the elements of the conflict so that the team can deal with them one at a time.
- Identify mutually exclusive needs or wants.
- Brainstorm to find alternatives to resolve the conflict.
- Determine areas of agreement.
- Develop a plan to act on those areas of agreed alternatives, and do it.
### Five Basic Methods for Resolving Conflict

<table>
<thead>
<tr>
<th>Methods</th>
<th>What Happens When Used</th>
<th>Appropriate to Use When</th>
<th>Inappropriate to Use When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power or Dominance - Competition</td>
<td>One's authority, position, majority rule, or a persuasive minority settles the conflict. Results in win/lose if the dominated party sees no hope for self.</td>
<td>When power comes with position of authority; when this method has been agreed upon.</td>
<td>Losers have no way to express needs; could result in future disruptions.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Abilities, values and expertise of all are recognized; each person's position is clear, but emphasis is on group solution. Results in win/win for all.</td>
<td>Time is available to complete the process; parties are committed and trained in use of process.</td>
<td>The condition of time, abilities, and commitment are not present.</td>
</tr>
<tr>
<td>Compromise or Negotiation</td>
<td>Each party gives up something in order to meet midway. Results in win/lose if &quot;middle-of-the-road&quot; position ignores the real diversity of the issue.</td>
<td>Both parties have enough leeway to give; resources are are limited; when win/lose stance is undesirable.</td>
<td>Original inflated position is unrealistic; solution is watered down to be effective; commitment is doubted by both parties involved.</td>
</tr>
<tr>
<td>Avoidance</td>
<td>Person tries to solve problem by denying its existance. Results in win/lose.</td>
<td>Issue is relatively unimportant; timing is wrong; cooling off period is needed; short-term use.</td>
<td>Issue is important; when issue will not disappear, but build.</td>
</tr>
<tr>
<td>Suppression or Smoothing Over-Accommodation</td>
<td>Differences are played down; surface harmony exists. Results in win/lose in forms of resentment, defensiveness, and possible sabotage if issue remains suppressed.</td>
<td>Same as above, also when preservation of relationship is more important at the moment.</td>
<td>Reluctance to deal with conflict leads to evasion of an important issue; when others are ready and willing to deal with issue.</td>
</tr>
</tbody>
</table>
Skills for Managing Conflict

1. LISTENING
   
   **Active Listening**
   Accurately hearing the total message including words and feelings. It is listening for what the other person wants to say, not for what you want to hear.

   **Selective Listening**
   Listening for and choosing information to use as a basis for additional questions.

   **Responsive Listening**
   Acknowledging relevant information to encourage further comments. Ensuring that your understanding of the situation matches the other person's understanding. (For more information on listening, see "Communication Skills".)

2. QUESTIONING

   - To get information and clarification we need to perform our jobs efficiently and professionally.
   - To discover additional problems that will allow us to provide value-added service to our clients and/or effectively negotiate with others.

   **Closed Questions**
   - Can be answered with a simple "yes" or "no", or with a relevant fact.
• Give us specific information about the problem.
• Do not help us find out how the other person feels about the problem or what he/she believes should be done about it.

• Open Questions
  • Help us get at the beliefs and feelings that may be relevant to a problem.
  • Encourage longer responses.
  • Show interest in the other person's view.
  • Especially useful when you suspect there may be more to the problem, or when the other person is angry or upset.

3. SUPPORTING/DEALING WITH ANOTHER'S ANGER
  • Anger is a natural response when we believe we have been treated unfairly or when we experience the frustration of unmet expectations.
  • Dealing with our own anger.
    • Turn the blame and attribution into "I" statements to develop a sense of personal power.
  • Dealing with another's anger.
    • Anger often makes us feel threatened or defensive, we do not want to get angry ourselves.
    • Avoid getting "hooked" into someone else's anger.
    • Remind yourself that the other's anger is not directed at you personally but at the problem.
    • Avoid letting the situation escalate.
    • Help solve the problem that the other person's getting upset about.
    • Focus objectively on the relevant facts in a situation.
4. **NEGOTIATING EFFECTIVELY**

In a conflict situation, it is necessary to enter the situation from the concept of problem-solving. The behaviors necessary for effective negotiation need to be thought out before hand and monitored during the interaction.

- Clearly articulate your "wants" assertively.
- Use direct statements, which say what you mean.
- Use objective words.
- Act in an assured manner.
- Convey your confidence in your ability to help resolve the conflict.
- Communicate caring and strength.
- Clearly listen, hear and understand other's "I want"s.
- Display attentive attitude, active listening.
- Identify similar "wants" and agree to it.
- Include only necessary information, not details.
- Keep the explanation simple, avoid technical jargon.
- Try to see the idea or solution through the other person's eyes.

**When suggesting solutions:**

- Explain what the solution is,
- How the solutions will work,
- What will the solution do for the person, and
- How will the person feel when the conflict is solved.

Reaching agreement requires that individuals engage in a process to work through conflict.
Let's do an exercise on handling conflict situations.
Problem Behaviors Exercise

PURPOSE

To provide skills practice in dealing with problem behaviors.

AGENDA

- Break into teams as assigned by the instructor.
- Study the cartoon characters assigned to your team.
- Identify the particular problem behavior which each depicts.
- Derive a name for your team's characters based on what behavior your team agrees each is displaying.
- As a team discuss and agree on how you would handle each of the problem behaviors.
- Select a spokesperson(s) to present your findings on each character.

LIMIT

- 15 Minutes
YOU ARE HERE.
Problem Behaviors Exercise

Record Team Findings Here:

<table>
<thead>
<tr>
<th>NO.</th>
<th>Character's Name</th>
<th>Character's Behavior</th>
<th>Method Of Handling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Action Plan**  A technique that documents everything that must be done to ensure effective implementation of a countermeasure or improvement.

**Bar Graph**  A graphic representation which compares discrete items in non-touching bars of uniform width. The length of each bar is proportionate to the quantity being represented.

**Barriers and Aids**  Barriers are elements resisting change. Aids are elements pushing for change. Barriers and Aids Analysis is also referred to as "Force Field Analysis" and can be useful in developing action plans.

**Benchmarking**  The continuous search for best practices that lead to superior performance and that are beneficial in establishing performance targets.

**Brainstorming**  A technique designed to encourage creative thinking and generate many ideas quickly.

**Catchball**  Negotiating targets and budgets with facts among various levels of an organization in a spirit of "Win-Win".

**Cause and Effect Diagram**  A diagram used to relate cause and effect to help determine possible root causes; sometimes called Fishbone Diagram or Ishikawa Diagram (after its originator).
Checklist  A list of items or steps necessary to complete a specific activity.

Checksheet  A form on which data are systematically collected and recorded in a uniform manner.

Continuous Improvement Process (CIP) Team  A group of employees assigned by management to improve operational performance by process improvement of problem resolution.

Control Chart  A special type of line or trend graph to track performance and indicate whether an ongoing process is within specification or statistical limits.

Core Process  The key, high level processes of an organization which deliver products and/or services to the customer, and the success of which is judged by the customer.

Countermeasures Matrix  A matrix of factors to help show the relationship between effect, root causes and countermeasures. It also helps the team to evaluate which countermeasures should be implemented, considering effectiveness and feasibility.

Critical Few Objectives (CFOs)  The highest level priorities established by an organization which have been targeted for significant improvement.
Cross-Functional Team  A team whose members come from more than one functional group to work on improvement opportunities that cut across functional or organizational lines.

Customer  The person or group that receives the output (product or service) of our process. The customer may be external or internal to the organization.

Customer Next Process  Process used to identify our customer's wants, expectations, and needs. A phrase which sums up the customer satisfaction orientation necessary for quality both for external and internal customers.

Data  Any facts the team may be able to gather. Can be in the form of numbers, words or pictures.

Data Gathering Tools  Tools used to collect useful data, such as checksheet or survey form.

Deming Prize  An award given by the Japanese Union of Scientists and Engineers (JUSE) to Companies meeting ten specific criteria for Total Quality Control.

Empowerment  The investment in employees of authority and responsibility for making decisions and taking actions, particularly to satisfy customers and improve processes. Empowerment requires that employees be enabled through training, information, resources and advice.
**Facilitator** A person that supports teams as a trained coach, communicator, coordinator, promoter and teacher of the QIC Story process.

**Fat Rabbit** The biggest bar on a Pareto Chart. Rule of thumb - "If it can not be quantified then it is not a Fat Rabbit. It may not even be a rabbit".

**Fishbone Diagram** See Cause and Effect Diagram.

**Functional Team** A team which consists of members from a single work area. All members may share a common foreman, supervisor or manager.

**Golden Thread** The known and understood link between the employee's performance improvement actions and the stakeholder. The gold will be found on the organization's bottom line (i.e., cost savings and client outcomes achieved).

**Histogram** A visual display of the information presented in a frequency distribution. A series of touching rectangles or bars of equal width that are proportionate in height to the frequency in a particular class.

**Interviewing** Technique used to obtain useful data and information from others.
Ishikawa Diagram  This diagram, known as the Cause and Effect Diagram, was developed by Dr. Kaoru Ishikawa to show the relationship between an effect (or problem) and its possible causes. Dr. J.M. Juran was the first to refer to it as the Ishikawa Diagram in 1962. (See Cause and Effect Diagram).

Lead Team  A team that functions as a non-problem solving steering committee comprised of management. Lead Teams may be formed at all levels of the organization and may also be called Quality Councils.

Malcolm Baldrige National Quality Award  An award given by the U.S. Department of Commerce to American Companies and/or Business Units which achieve business excellence and meet specific criteria in seven categories.

Management Presentation  An opportunity for the team to describe their use of the QIC Story process to their managers and to solicit management approval for implementation of the team's solution. The QIC Story is the standard method used to demonstrate the approach used to improve performance.

Multivoting  A method of voting to help reduce a large number of items to a manageable few while achieving consensus of the group members.

Needs  The customer's requirements. They may be spoken or unspoken, and often not even known by the customer. Nevertheless, they must be met.
UNIT 8

Glossary of Terms

**P-D-C-A**  Plan-Do-Check-Act cycle of continuous improvement. **Plan** using data, **Do** or implement the plan, **Check** your results and **Act** upon what was found. This concept was adapted from Dr. F.W. Taylor’s concept of Plan-Do-See by Dr. Walter A. Shewhart of Bell Laboratories (now AT&T) in the early 1930s.

**Pairwise Ranking**  A structured method for ranking a small list of items in priority order. It can help you prioritize a small list and make decisions in a consensus-oriented manner.

**Pareto Analysis**  A method to separate the “significant few” data from the “trivial many.”

**Pareto Chart**  A type of bar chart used to indicate what major factors affect the subject being analyzed. Bars are arranged in descending value order. Named after Vilfredo Pareto, an Italian social economist who observed that most of the wealth in a society is controlled by a minority of the people.

**Poka-Yoke**  A technique used to prevent errors from resulting in defects. It is also known as “mistake proofing” in the U.S.

**Policy Deployment**  A process used by management to provide organizational focus. By aligning resources on a few stakeholder driven priorities, significant results can be achieved in a relatively short period of time. Policy Management consists of three phases; Establish, Deploy and Implement. P-D-C-A is inherent in each phase and the process as a whole.
**Problem**  An undesired condition or deviation from requirements. Problems are opportunities to improve organizational performance.

**Problem-Solving Process**  A systematic approach to problem-solving which reinforces the P-D-C-A principle. The QIC Story methodology is a problem solving process.

**Problem Statement**  A sentence that describes in specific terms what is wrong or an undesirable situation. It states the gap between actual performance and target and focuses on the stakeholder's "pain".

**Performance Improvement Teams**  Teams established to address issues negatively impacting customer, employee or other stakeholder needs. They may be assigned or voluntary.

**Process**  A flow by which material or energy is converted into a product or service. Processes are typically measured in terms of cost, quality, and time.

**Process Indicator**  A measure of how a process is performing with respect to the characteristics of cost, quality, time or safety. Process Indicators should link to Quality Indicators which are measures of how we are meeting customer needs.
**Process Management** The management of the conversion of material or energy into a product or service so as to continuously improve the outcome by making it better, faster, and cheaper than before. See also **Quality in Daily Work**.

**QA** Quality Assurance. Assuring that quality is designed and built into the product or service enabling the customer to confidently select and be satisfied with the product or service for a long, or specified, period of time.

**QC** Quality Control. Systematically producing the **most economical** products and services of **maximum utility** which **always meet** the requirements of customers.

**QI** Quality Improvement. The improvement of performance for the benefit of an identified customer or stakeholder need.

**Quality** Meeting the needs of customers and other stakeholders through the provision of products, services and consequences of operation.

**Quality Indicator** Measurement of the degree and/or frequency of meeting the needs of customers and other stakeholders.

**Recognition** Acknowledgement of improvement and praise, usually by external groups.
**Requirements** Specifications or standards which define expectations of a product or service or permissible consequences of operation.

**Root Cause** The verified primary stimulus behind an undesired condition, or problem.

**Scatter Diagram** A technique for investigating and visually displaying the possibility of a causal relationship between two variables.

**Six Sigma Process** A systematic method for improving a process to yield outputs that always meet the needs of customers. By effectively managing the process, defects can be prevented.

**Stakeholder** A person or group with a vested interest in the products, services and the consequences of operations of a supplier.

**Sterling Award** The Florida Governor's Sterling Award is specifically designed to recognize and promote excellence in achieving the total quality concept in the manufacturing, service, health care, public and education sectors in the State of Florida. It is awarded annually to those organizations that meet specific criteria in seven major categories. It is based on the Malcolm Baldrige National Quality Award.
Strategic Policy Management  A process used by management to provide organizational focus. By aligning resources on a few stakeholder driven priorities, significant results can be achieved in a relatively short period of time. Policy Management consists of three phases; Establish, Deploy and Implement. P-D-C-A is inherent in each phase and the process as a whole.

Stratification  The process of breaking data down according to characteristics or causes. This technique aids in understanding and solving a problem.

Symptom  A condition where evidence of a problem is manifested, although not necessarily understood.

TQM  Total Quality Management, another term for Company Wide Quality Control. The coordinated and systematic actions of all employees and departments in an organization toward meeting the needs of their customers at the lowest cost with the least negative impact on the environment and society.

Task Team  Members from one or more functional areas formed to solve a specific problem assigned by management. Members are chosen because of background, experience and specific knowledge.

Team Leader  A person who effectively guides the team through the problem-solving process.
**Team Member**  An active participant on a team to solve problems and effect improvements. Shares knowledge and experiences with other members.

**Theme Selection Matrix**  A technique which allows the ranking of themes by considering the **impact on the customer** and the **need to improve**. It embodies elements fundamental to effectively prioritizing resources.

**Tracking**  A process to observe or monitor the steps or phases of an action plan to determine if desired results are obtained.

**Trial Implementation**  An initial application of a countermeasure to check for effectiveness and unforeseen events prior to a full-scale implementation.
# ACTION PLAN

<table>
<thead>
<tr>
<th>No.</th>
<th>Task</th>
<th>Time / Schedule</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AGENCY OBJECTIVE | DISTRICT OBJECTIVE | INDIVIDUAL PROJECT | PREPARED BY
--- | --- | --- | ---
<table>
<thead>
<tr>
<th>ACTION PLAN</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>When</td>
</tr>
<tr>
<td></td>
<td>Who</td>
</tr>
<tr>
<td></td>
<td>How</td>
</tr>
<tr>
<td></td>
<td>What (To Accomplish)</td>
</tr>
</tbody>
</table>

Legend:
- □ = Proposed
- ■ = Actual
# Cost-Benefit Analysis

<table>
<thead>
<tr>
<th>TYPES OF COST</th>
<th>VALUE</th>
<th>TYPES OF BENEFITS</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL COST** __________  **TOTAL BENEFITS** __________

**COST-BENEFIT RATIO** = \( \frac{\text{BENEFITS}}{\text{COST}} \) = DECISION
# Project Planning Worksheet

## Theme

## Problem / Situation Statement
(Summarize)

## Team Work Location

## Team Name

<table>
<thead>
<tr>
<th>Team Members</th>
<th>Team Leader</th>
<th>Team Member 1</th>
<th>Team Member 2</th>
<th>Team Member 3</th>
<th>Team Member 4</th>
<th>Team Member 5</th>
<th>Team Member 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Leader</td>
<td>Team Member 7</td>
<td>Team Member 8</td>
<td>Team Member 9</td>
<td>Team Member 10</td>
<td>Team Member 11</td>
<td>Team Member 12</td>
<td>Team Member 13</td>
</tr>
</tbody>
</table>

## Duration

<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Time</th>
<th>Att.</th>
<th>#</th>
<th>Date</th>
<th>Time</th>
<th>Att.</th>
<th>#</th>
<th>Date</th>
<th>Time</th>
<th>Att.</th>
<th>#</th>
<th>Date</th>
<th>Time</th>
<th>Att.</th>
<th>#</th>
<th>Date</th>
<th>Time</th>
<th>Att.</th>
<th>Team Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Meetings

- = Proposed  ■ = Actual

### Step

<table>
<thead>
<tr>
<th></th>
<th>1997</th>
<th>1998</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Outline of Activities

- Reason for Improvement
- Current Situation
- Analysis
- Countermeasures
- Results
- Standardization
- Future Plans

## Comments
(How Each Step Was Done)
<table>
<thead>
<tr>
<th>Improvement Step</th>
<th>QIC Story Steps - Objectives and Checkpoints</th>
<th>Tools</th>
<th>Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP 1</strong> Reason for Improvement</td>
<td>Objective: Demonstrate the importance of improvement needs in measurable terms. 1. The stakeholder and need were identified. 2. An indicator measuring our performance in meeting the need was developed. 3. A theme statement consistent with the indicator was selected. 4. A schedule for completing the seven improvement steps was developed.</td>
<td>- Bar Graph, Line Graph, Pie Chart - Checksheet - Control Chart - Histogram</td>
<td>- Brainstorming - Consensus - Multivoting - Project Planning Worksheet - Survey-Interview - Theme Selection Matrix - Theme Statement</td>
</tr>
<tr>
<td><strong>STEP 2</strong> Current Situation</td>
<td>Objective: Investigate the features of the theme, select a problem, and establish a target for improvement. 5. The theme was stratified from various viewpoints and a significant problem was chosen. 6. A target for improvement was established based on the stakeholder's need. 7. The impact of the target on the theme indicator was determined. 8. A problem statement that addressed the gap between the actual and target values was developed.</td>
<td>- Bar Graph, Line Graph, Pie Chart - Checksheet - Histogram - Pareto Chart</td>
<td>- Problem Statement - Process Flow Chart</td>
</tr>
<tr>
<td><strong>STEP 3</strong> Analysis</td>
<td>Objective: Analyze the problem to identify and verify its primary root causes. 9. Cause and effect analysis was taken to the root level. 10. Potential causes most likely to have the greatest impact on the problem were selected. 11. A relationship between the root causes and the problem was verified with data. 12. The impact of each root cause on the gap was determined.</td>
<td>- Cause &amp; Effect Diagram - Checksheet - Histogram - Pareto Chart - Scatter Diagram</td>
<td>- Brainstorming - Delphi Technique - Multivoting - Nominal Group Technique</td>
</tr>
<tr>
<td><strong>STEP 4</strong> Countermeasures</td>
<td>Objective: Develop and implement countermeasures to eliminate the verified root causes of the problem. 13. Countermeasures were selected to address verified root causes. 14. The method for selecting the appropriate practical methods was clear and considered effectiveness and feasibility. 15. Barriers and aids were determined for practical methods worth implementing. 16. The action plan reflected accountability and schedule.</td>
<td></td>
<td>- Action Plan - Barriers and Aids - Brainstorming - Corrective Actions Matrix - Cost-Benefit Analysis - Multivoting</td>
</tr>
<tr>
<td><strong>STEP 5</strong> Results</td>
<td>Objective: Confirm that the countermeasures taken impacted the root causes, the problem, and the theme. 17. The effect of countermeasures on the root causes was demonstrated. 18. The effect of countermeasures on the problem was demonstrated. 19. The improvement target was achieved and causes of significant variation were addressed. 20. The effect of countermeasures on the theme indicator representing the stakeholder's need was demonstrated.</td>
<td>- Bar Graph, Line Graph, Pie Chart - Checksheet - Control Chart - Histogram - Pareto Chart</td>
<td>- Action Plan - Procedures - Process Flow Chart - Process Management System - Standards - Training</td>
</tr>
<tr>
<td><strong>ACT</strong></td>
<td>Objective: Maintain and share the gains. 21. A method was established to document, permanently change, and communicate the revised process or standard. 22. Responsibility was assigned and periodic checks scheduled to ensure compliance with the revised process or standard. 23. Specific areas for replication were identified.</td>
<td></td>
<td>- Action Plan - Process Flow Chart</td>
</tr>
<tr>
<td><strong>STEP 7</strong> Future Plans</td>
<td>Objective: Evaluate the team's effectiveness and plan future activities. 24. Any remaining problems of the theme were addressed. 25. Lessons learned, P-D-C-A of the QIC Story process, and team growth were assessed and documented.</td>
<td></td>
<td>- Action Plan - Radar Chart (or Spider Diagram)</td>
</tr>
</tbody>
</table>
### Task Assignment Plan

**Task Assignment Plan**

**Practical Method**

**Task**

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Resources Needed</th>
<th>Date to Be Completed</th>
<th>Accountable Person</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# TEAM MEETING MINUTES

<table>
<thead>
<tr>
<th>Date: ____________________</th>
<th>Attendees: ____________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Time: ______________</td>
<td></td>
</tr>
<tr>
<td>End Time: _______________</td>
<td></td>
</tr>
<tr>
<td>Meeting Number: __________</td>
<td></td>
</tr>
<tr>
<td>Distribution:</td>
<td></td>
</tr>
<tr>
<td>•</td>
<td></td>
</tr>
<tr>
<td>•</td>
<td></td>
</tr>
<tr>
<td>•</td>
<td></td>
</tr>
<tr>
<td>•</td>
<td></td>
</tr>
<tr>
<td>•</td>
<td></td>
</tr>
</tbody>
</table>

**MEETING MINUTES** (key points):

•
•
•
•
•
•
•
•
•

**MEETING CRITIQUE**

Next Meeting Date: __________ Time: __________ Location: ____________________

Next Meeting Agenda: _______________________________________________________

________________________________________

Recorder: ______________________________
<table>
<thead>
<tr>
<th>Themes</th>
<th>Impact on Customer X Need to Improve</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 - Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 - Moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 - Extreme</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>