

ESTABLISHING A QUALITY FUNCTION

PRACTICE OBJECTIVE

This practice describes how to establish, organize and staff a quality function. It recommends how to acquire the proper people for the function. The material also describes the creation of a plan for implementing quality principles into information services (I/S) through the quality function.

While a quality function is not necessary to make quality happen, it rarely happens without a catalytic force behind the effort. Quality is a management responsibility. The quality function is a staff function which helps information services management fulfill those quality responsibilities. This function is usually best when small.

The objective of this practice is to provide a step-by-step process for establishing a function called the quality function. The proposed objective for this function will be to improve the quality (i.e., reduce defect rates) within information services through the establishment of quality control, measuring quality and productivity, and establishing quality improvement programs to improve the information services processes.

The quality function has been implemented in hundreds of companies. These quality functions have demonstrated that quality can be defined and measured. Experience has shown that effective quality does increase productivity, and pays for itself by actually reducing costs. Quality is the solution for the 1990s.

PRACTICE WORKBENCH

Improving quality does not require a quality function. However, without a group charged with the mission for improving quality, it may not happen. There is a high correlation between organizations producing high-quality work products and services and organizations having a quality function.

Prior to establishing a quality function, a need and desire must be established on the part of senior management. This need must then be accompanied by the resources needed to form a quality function. A four-step process is shown (illustrated in Figure 1 on the next

page), which will develop an effective quality function with an associated plan of action.

INPUT PRODUCTS

The key concept to establishing a quality function is establishing the need for quality. An agreed-to need for quality must exist prior to taking action. Until management believes there is a need for quality improvement, the real impediment (i.e., management) cannot be dealt with.

Establishing a quality function requires a plan. If a plan is not established, the role of quality within information services will not be clear.

The development of a plan to establish a quality function is the responsibility of information services management (including the quality manager when appointed). The accomplishment of a plan involves the following four parties:

- 1) Information services management
- 2) Information services project leader(s)
- 3) User management (responsible for computer systems)
- 4) Management of the quality function

A plan of action for the establishment of an effective information services quality function is outlined in Figure 2. This figure shows four steps and eight tasks needed to effectively establish the information services quality function.

The tasks which are the primary responsibility of information services management are:

- Define an information services quality policy
- Select the quality manager
- Select the initial quality initiatives for the quality function to address

- Place the quality function organizationally in the information services function at the highest level where the function can be successful

The manager of the quality function has the following primary responsibilities:

- Write a quality charter
- Staff the quality function
- Develop a quality training program
- Develop a quality work plan to support the quality charter

IMPLEMENTATION PROCEDURES

The practice for establishing a quality function can be divided into four steps and eight tasks. Each of the four steps will be individually discussed. The purpose for dividing the tasks into four steps is to group them into homogenous categories so that they can be implemented concurrently. Figure 2 relates the four steps to the eight tasks in the recommended plan of action.

Step 1: Define the Quality Function Role

Inadequate attention to quality in the information services function is normally reflected in high systems maintenance costs and user dissatisfaction. Through the promotion of effective quality practices, the quality function can normally reduce the cost of systems development, operation and maintenance, and improve user satisfaction. However, without a group charged with the responsibility for ensuring quality, the pressure of meeting schedules and budgets frequently takes precedence over quality.

The role of the quality function is to establish processes which produce defect-free products. This is a long-term role, which may take years to accomplish. The initial role will be addressing the various contributors to quality.

Guidelines in selecting the immediate role and responsibility of the quality function follow.

- **Guideline 1** - Do what people think needs doing: Work in those areas where people believe improvement is needed. If the areas have been ranked in order of importance to the raters, then the quality role should address the highest ranked areas.

Figure 1. Establishing A Quality Function Workbench

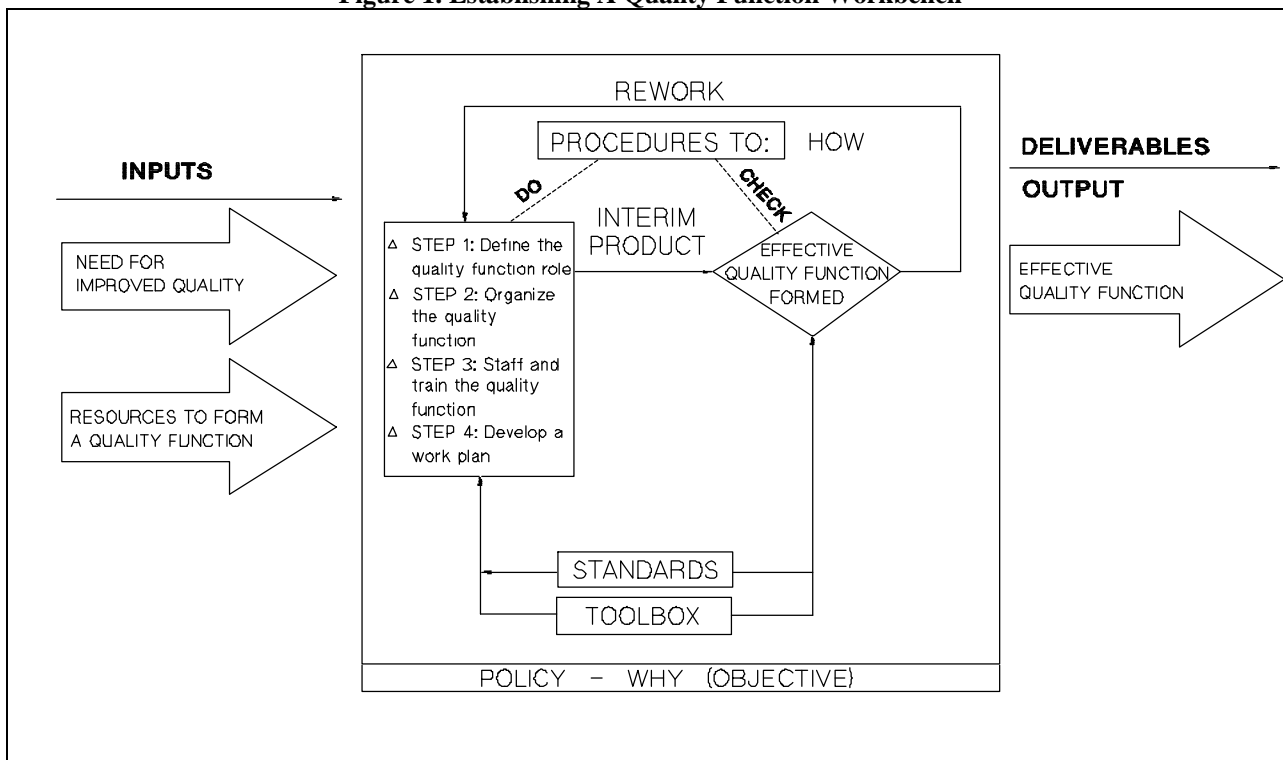


Figure 2. Quality Function Plan of Action

#	TASK	STEP	RESPONSIBILITY			
			INFORMATION MANAGEMENT	PROJECT LEADER	USER MANAGEMENT	QUALITY FUNCTION
1.	Define an information services policy	1	P			
2.	Select the quality manager	1	P			
3.	Select quality issues for the information services function	1	P	S	S	S
4.	Write a quality charter	1	S			P
5.	Place the quality function organizationally in the information services function	2	P			
6.	Staff the quality function	3	S			P
7.	Develop a quality training program	3				P
8.	Develop a quality work plan to support the quality charter	4	S			P

P = Primary Responsibility
 S = Secondary Responsibility

- **Guideline 2** - Make short-term tasks consistent with long-term objectives: Ensure that the short-term role is consistent with the long-term quality objectives. Everything that the quality function does should help meet the objective of producing defect-free software.
- **Guideline 3** - Work in areas you know: Select those initial areas in which you personally believe you can be successful. Since you could begin attacking any contributor to quality, it does not matter particularly where you start. However, within guidelines 1 and 2 select activities and programs in which you have a personal interest and adequate skills to be successful. Much of the success of the quality function involves personal leadership, dedication, and hard work. Thus, you must be convinced that

you can pull off the objective/goal you establish in the quality role.

- **Guideline 4** - Limit your tasks, and do a few things well: Do not try to do too many activities initially. It is better to do a few things well than a lot of things poorly. Again, if you rely on the involved parties to identify the areas in most need of improvement, and you believe you can improve those areas, you will rarely go wrong. This last guideline helps you ensure that you have sufficient resources to do those activities included in your role.

Step 2: Organize the Quality Function

Planning is the inspiration of action. But the thing done is what counts-not the thing thought of. The world is full of starters, but there are few finishers. Lack of action is a direct cause of most failures. Knowing that a quality function is needed is not enough; the group must be organized and supported.

Organizing the quality function involves determining what tasks the function should do, the quantity and skill level of people needed to accomplish those tasks, and where the function should be placed organizationally to provide it with the greatest probability of success. The failure of information services management to fully support the quality function has been cited as the number one cause of failure for the quality function. Management must support the quality function, and this is done by involving your management in the day-to-day quality activities.

Information services management has taken two different approaches in organizing the I/S quality function. The first approach is to select an individual to head the function and then let that person run with the ball. This takes minimal effort on the part of information services management, but at the same time, limits the probability of success. The second, and more desirable, approach is to develop a quality charter and then staff and support the accomplishment of that charter. Note that in the latter approach the information manager and the future quality manager can share the task.

The quality charter is a job description for the quality function. It explains to all affected parties the scope and responsibilities of the quality function. The scope and responsibility should be stated as explicitly as is done on an individual's job description.

A quality charter is needed for the following reasons:

- Determining the caliber of people needed to fulfill the quality function responsibilities
- Determining where in the organization structure the function needs to be placed to obtain the needed authority and management support to successfully accomplish the assigned tasks
- Limiting the scope of the quality function to a group of achievable tasks

- Notifying the affected parties of the responsibility and authority of the quality group
- Placing the responsibility for quality with the project team(s), as opposed to making the quality function responsible for the quality of the application systems
- Providing a tool for measuring the effectiveness of the quality group

Quality is a managerial function. It is most effective when it is viewed as a managerial function, and given the necessary authority to act as such. Many corporations use the quality function as a training ground for future information services management.

Quality groups are organizationally located as follows (The percent of quality groups of each organizational classification is indicated in brackets. Note that this is an estimation made by QAI based on experience.):

- Reports to information services manager (50%)
 - The best positioning of the quality group appears to be reporting directly to the information services manager. This gives the quality function manager immediate access to the information services manager to discuss and promote quality issues. When the quality function manager reports elsewhere, quality issues may not be raised to the appropriate level and thus may not receive the necessary action.
- Reports to manager of systems/programming (25%) - The quality function is normally the weakest when reporting to the manager of systems/programming. The reason is that most quality reviews involve applications for which this manager is responsible. Normally, it is more desirable to solve problems within a group; thus it is easy to squelch many quality concepts.

- Reports to manager of computer operations (15%) - Quality in computer operations is normally a very strong function in that it usually has the ability to stop nonquality projects from being run on the computer. While management may override building quality concepts into an application in order to get it done quicker, they will rarely risk crashing computer operations to run a nonstandard system. On the other hand, the quality group within computer operations rarely has the opportunity to influence applications during the development process. They see and judge the finished product. Changes made at this point in time may be very costly.
- Reports outside of the information services function (10%) - Reporting outside the information services function provides the quality group with an independence not possible when the group reports within the information services function. This organizational arrangement is more prevalent when the applications will either be sold or used in locations other than where the application was developed. In other words, if the organization bases its reputation on quality (i.e., the product is sold), or maintenance personnel are not readily available (i.e., the application is run in remote areas), the stamp of approval by an independent quality function is frequently warranted.

The quality function is a staff function which assists management in fulfilling its quality responsibilities. These activities involve establishing policies, procedures, standards, and the processes/work patterns used in the information services function. In order to do this, it is important that the quality function not report to a line manager responsible for any part of the day-to-day production work of the information services function.

A suggested reporting scheme is illustrated in Figure 3.

Step 3: Staff and Train the Quality Function

The quality function manager in a major corporation is affectionately known in the department as "Captain Quality." While this designation may

seem humorous, it is indicative of the enthusiasm and belief in quality that is needed to make the function successful. If the quality manager is not a believer in the function, it will be difficult to convince the rest of the department that quality is important.

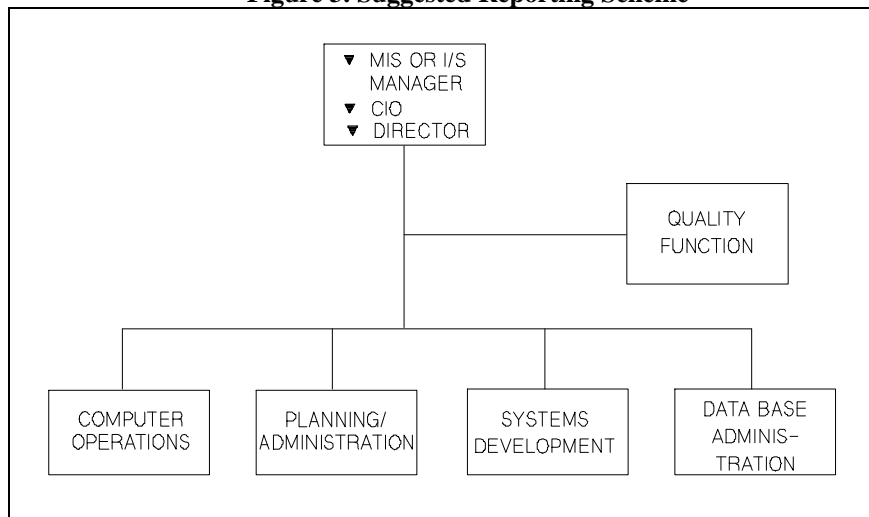
The quality staff is in the business of selling quality. The product is good, and no one is against it, but it must compete with the other concerns and principles of management. If management evaluates personnel on nonquality factors such as schedules and budgets, then quality will be a difficult product to sell.

The quality manager should serve as the quality conscience of the department. It is this individual who should lobby for quality information services objectives and who recommends the means for achieving those quality objectives. It is a good position for a crusader. The wrong individual may waste resources just monitoring compliance to policies regardless of their merit and value to the information services department. The wrong person may also get involved in quality control and ignore the assurance function.

The individual appointed manager of the quality function should be:

- A spokesperson for quality in the information services department
- Enthusiastic about the function as a vehicle for achieving quality
- Self-motivated and aggressive
- Objective and open-minded about different

Figure 3. Suggested Reporting Scheme



approaches to information services methods and application design

- A good communicator, both written and oral
- Able to work well with and through people
- Willing to let others accept credit for his/her recommendations

Over 90 percent of all personnel now in quality have information services experience. While I/S skills are important, other skills are equally important. The Quality Assurance Institute certification program requirements provide insight into the skills needed to be a successful quality professional. Staff with the best people you can. It is better to have no staff than the wrong staff.

Sources of Personnel

There are five sources from which quality personnel are normally selected. These sources are discussed below and summarized in Figure 4 on the next page.

Senior systems analysts

Organizations normally select their quality analysts from the most senior people in the information services department. In some organizations, movement to quality is a promotion for a senior systems analyst position. These individuals have worked in the information services department for many years and are highly respected by the less senior people in the department. Many of them are able to promote quality and improve systems structure based on their own prestige, knowledge, experience in the department, and from having taught and worked with many of the people in the information services function. The disadvantage of staffing the quality function with these senior people is that they may want to practice quality control rather than quality. Also, when a person is selected because they have unique skills and attributes, the function may be built around that individual. When that individual leaves, the function may falter or need to be restructured because no one with the same credibility, desires, and experience will be available to fill the position in the same way.

Information services personnel (other than senior systems analysts)

Most quality analysts come from the I/S function. They are skilled in information services and the methods of operation of the department. In addition, they are

known to the I/S manager, so their performance in the quality function can be anticipated.

If the quality analysts selected are not senior members of the information services staff, the quality manager may have to answer the following questions which are frequently posed by the more senior systems analysts about the abilities of the quality staff:

- 1) How can an individual with less experience than a senior systems analyst possibly make a contribution to a project?
- 2) Isn't quality just another impediment posed by management to stop the systems analysts from doing their work on time and within budget?

Senior systems analysts becoming quality analysts may not be asked those questions, but all other quality analysts may. How well they are able to answer those questions, and the type of support received by management, frequently determines the effectiveness of the quality group.

User personnel

The quality function has been accused by some of being an immature profession because it is staffed almost exclusively with information services personnel. The argument is that the people who have caused the quality problem should not be selected to solve the quality problem. An alternative to staffing the quality function with I/S personnel is to staff with user personnel. User personnel are independent from the current information services practices, and can look at those practices from an objective viewpoint and judge the value of those practices to the organization. These people understand what users need and how they work. The disadvantage of staffing the quality function with user personnel is a potential lack of I/S skills with the possibility that they may not fully appreciate the consequences of improperly structured computer systems. In addition, user personnel may not have the respect of I/S personnel as they work with them to develop quality solutions.

Figure 4. Sources of Quality Professionals

SOURCE	ADVANTAGE	DISADVANTAGE
Senior systems analyst	<ul style="list-style-type: none"> · Highly respected · Skilled in information services and department 	Success of function dependent on prestige of individual
Other information services personnel	<ul style="list-style-type: none"> · Skilled in information services and department · Proven track record 	May not have respect of senior systems analysts
User personnel	<ul style="list-style-type: none"> · Independent of department procedures · Understands user concerns 	<ul style="list-style-type: none"> · May not know information technology · May not have respect of senior systems analysts
Quality professionals from other organizations	<ul style="list-style-type: none"> · Skilled in information technology · Knows how to perform quality function tasks 	<ul style="list-style-type: none"> · Does not know organization · May not have respect of senior systems analysts
Quality-related skills (e.g., industrial engineer)	<ul style="list-style-type: none"> · Knows how quality works · Skilled in quality improvement programs 	<ul style="list-style-type: none"> · May not know information technology · May not have respect of information staff

Quality professionals (from other organizations)

Infusion into the organization of people that understand quality may be helpful in establishing the function. Unfortunately, some organizations have had poor experience using outside quality people. There is no guarantee that people with quality experience from other organizations will be able to establish a more successful function than well-respected people from within their own organization. The problems outside personnel face is a lack of understanding about the organization and, of course, gaining the respect of the senior system analyst.

The practice of quality requires merging many different skills. For example, quality staff may need to know accounting, statistics, behavior sciences, work effectiveness, etc. Since no one will be proficient in all these skills, a larger quality group may obtain an individual to supplement a deficient skill within the group, for example, statistics. Also, someone from a similar field, such as industrial engineering, may be a good quality candidate.

Job descriptions should be developed for quality professionals. (Note: QC responsibilities should be added to all analyst, programmer, and operator job descriptions.)

Staffing Recommendations

The key to staffing the quality function is to select the proper manager. QAI's experience has shown that quality is most successful when staffed with experienced information services personnel who are in line for I/S managerial functions. Many organizations have headed the quality function with a technician who is effective at technology, but fails to promote quality from a managerial perspective. On the other hand, the potential information services manager understands quality from a business perspective in addition to a technical perspective. This individual will also establish a function that can continue to perform after that individual has been promoted.

Most quality functions are started by a single individual. However, except in very small organizations this should only be a temporary measure to develop the policies, procedures, and work programs for the group. QAI's surveys show that a staffing ratio of one quality analyst for every 40 information professionals personnel was a good staffing ratio for initial start-up. However, the staffing ratio is really dependent upon the quality mission.

The experience of one large organization that has had a quality function for ten years indicated that the objective of the quality group should be to put itself out

of business. They claimed that the quality function was necessary to draw attention to management's desire for quality and to develop, teach, and enforce quality concepts. Their experience indicated that after approximately ten years the need for a large quality staff diminished, as an environment had been established in which quality could flourish. The smaller staff merely maintained the quality concepts and procedures to complement the changing technology.

At the current time there is a severe shortage of trained quality analysts. There appears to be no quick solution to this shortage, as the quality concepts and methods are still being developed.

Quality Professional Skills

The three characteristics that appear most frequently in successful quality analysts are:

- 1) **A believer** - The individual is enthusiastic and spreads that enthusiasm about quality in information services.
- 2) **Managerial traits** - The individual has managerial characteristics.
- 3) **Communicator** - Can express ideas well in oral and written communication.

The Quality Assurance Institute surveyed quality groups and asked them what skills they believed were necessary to be successful in the quality function. Their responses in order of priority were:

- 1) **Verbal communication** - Ability to communicate orally with management, users, and systems analysts
- 2) **Written communication** - Ability to communicate through letters and reports with management, users, and systems analysts
- 3) **Systems knowledge** - Understands how systems are designed and constructed
- 4) **Knowledge of operations** - Understands how computer applications are operated on the computer hardware and software
- 5) **Computer systems knowledge** - Understands how computer systems are designed and constructed

- 6) **Business system design** - Understands how to solve a business problem independently of the method by which that solution will operate
- 7) **Project management** - Has experience in managing a systems project
- 8) **Programming** - Can design, program, and debug a program in one or more languages

Training Quality Professionals

Very few training opportunities exist for quality analysts to learn quality tasks. If the quality analyst has come from a discipline other than information services, he or she must learn I/S concepts. The QAI reference materials listed in Section MGT. 1.3 of this manual indicate the better reference material for quality analysts.

The methods by which quality analysts are trained include:

- **On-the-job training** - The quality manager instructs quality personnel in how to perform their function.
- **Quality training courses** - Many quality skills courses are available from the Quality Assurance Institute.
- **Interfacing with systems development methodologies** - Many systems development methodologies explain how to perform the quality control tasks.
- **Study-related disciplines** - Many courses teach disciplines that are helpful in performing the quality function, such as:
 - Business systems design (emphasis on fact-finding)
 - Auditing (emphasis on fact-finding)
 - Control design (emphasis on detecting and preventing problems)
 - Statistical quality control

Step 4: Develop A Quality Plan

Annually, a plan should be developed/revisited for the quality function. The plan should be based on:

- The I/S mission-strategic goals and initiatives
- The information services department's quality policy
- The quality function charter
- The identified defect-prone products and processes

The quality plan should be task/activity oriented. The activities within the plan should be directed at specific accomplishments, and not ongoing activities. The ongoing quality activities are control activities, and should be performed by line personnel.

The quality plan should include the following planning information for each task/activity included within the plan:

- **Activity/task** - The work to be performed by the quality group.
- **Objective** - The specific quality objective to be accomplished by the activity. It is best when this is directed at a specific defect or category of defects.
- **Quantitative measure of success** - The specific measurable objective to be accomplished. Note that this is normally defect reduction; for example, reducing production abnormal terminations by 30 percent.
- **Individual responsible for objective** - The name of a single individual who will be responsible for accomplishing this objective.
- **Resources** - The amount of resources including people allocated to accomplish this objective.
- **Accomplishment schedule** - The checkpoint dates at which specific activities are to be accomplished.

NOTE: This quality plan is for the quality professionals, NOT the information professionals.

CHECK PROCEDURES

In determining whether an effective quality assurance group has been formed, the following questions should be answered affirmatively:

- 1) Has the quality function been established as a proactive group, rather than a reactive function?
- 2) Has the quality function been established to listen to, and represent, the end user?
- 3) Does the quality function plan to emphasize meeting objectives as opposed to just following processes?
- 4) Has the quality function been established with the type of people that are needed to make the function successful?
- 5) Can the quality function demonstrate the value of following quality practices?
- 6) Will the quality function operate with a "lean" staff?
- 7) Do the project personnel have the responsibility for quality, while the quality function is the catalyst in encouraging and evaluating quality?
- 8) Does the quality function have adequate management support/commitment to be successful?
- 9) Does the quality function have adequate resources to perform its mission?
- 10) Does the quality function have the appropriate authority to perform the tasks needed to accomplish its mission?

DELIVERABLES

The following deliverables should be developed either before or during the establishment of a quality function:

- Information services quality policy
- Quality charter for the quality function
- Locating the quality function as a staff activity in the information services organization
- Selecting and appointing adequate staff to perform the mission as defined in the quality charter
- Adequate training for the quality function staff
- Quality work plan to support the quality charter

USAGE TIPS

Some hints for establishing an effective quality function are:

- **Recognize it as a long-term process:** Developing an effective quality process is a long-term process (12-24 months should be allotted for establishment).
- **Use senior people:** The function should be staffed with senior people, not young technicians. These individuals need to be thoughtful, inquisitive, analytical, and firm.
- **Include quality in all training programs:** Quality needs to be included in all training programs and the emphasis on quality should be the benefits derived from using quality practices.
- **Management is responsible to enforce quality:** Quality must be enforced.
- **Quality requires discipline:** Quality must be developed into a discipline (there must be a rigorous definition of rules so that quality is habit-forming).
- **Make workers accountable for quality:** Systems analysts/programmers must be made accountable for the quality of their work. All quality responsibilities must be clearly defined.
- **Do not make the quality function responsible for quality:** The quality function cannot be responsible for quality. The primary responsibility for quality must be with the user and the information services project team. The project team must work hand in hand with the quality group to develop quality applications.
- **Incorporate the quality plan into the business plan:** Quality must be planned. Information services management must develop a visible strategy for implementing quality in their function.

Developing a quality environment in information services is a long-range program. Information services management should not expect significant improvements in the quality of I/S during the first 12 months after the quality function is established. However, this does not mean that the quality group will not provide short-range benefits. Short-term gains can and should be achieved, but they may be difficult to substantiate. The slow development process of application systems (e.g.,

12 months) will mean the impact of implementing quality concepts will not be felt in production until the system goes into production. After one year, quality should continually improve during the next several years.

Managing quality means the quality group should be a catalyst and a leader for improved quality within the information services function. Quality is one of several priorities within an I/S function. The other priorities include meeting schedules, completing projects within budget, handling day-to-day crises, planning new strategies, and so forth. Quality will not stay number one unless there is a strong leader behind the quality movement. Quality involves tradeoffs.

Managing quality means overseeing your company's quality processes. It means being the catalyst that makes quality happen. It means ensuring that the right quality initiatives are started, and that they are successfully completed. It means involving the right people in quality. It is an all-encompassing action that becomes the force behind quality in your company. Once the functions of quality are in place, those programs must be managed.

At least one out of three quality functions fail within a two-year period. In other organizations quality is more of a "buzz word" than a reality. Only a small handful of quality functions are totally successful. Much of the reason for the inability to make quality programs work is the lack of leadership.

Many quality managers look to their management for the appropriate support. Some quality managers do not want to make the personal sacrifice and effort needed to make quality happen. In other instances, the quality group is just not aware of how to make it happen. There are perhaps more reasons why quality programs don't work than reasons why they work.

Invariably, the reason quality works is because one or a few key people want to make it work. It is the contagious enthusiasm for quality sparked by a quality manager that makes it happen. It is that something extra special that leaders have that change behavior and attitudes toward making defect-free products and services.