# CHAPTER 4
# Historical Perspective on Project Quality Management

*Dr. Abdul Aziz A. Bubshait*

**CEM – 515**
**Construction Quality Assurance**

# Introduction

- CDPM's foundation is in the integration of the *project management* and *total quality management* approaches.

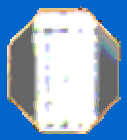
- CDPM expands the boundaries of both *total quality management* and *project management* by using the *customer* (or customer's voice) to drive an organization to complete a project, focusing on total customer satisfaction.

# Introduction

- With CDPM, the customer leads the project, requiring the customer to use the organization's resources to achieve customer satisfaction.

- Total customer satisfaction is the most important objective of the CDPM organization.

# Introduction



- In customer-driven project management, *strong people-oriented leadership* and *effective task-oriented management* throughout the organization are both necessary to satisfy the customer.

- *People* are the most important resource and are the primary means to *add value* to a deliverable that is necessary when striving for total customer satisfaction

# Introduction

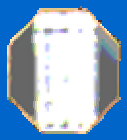
- The basic changes to traditional project management, which form , the foundation of customer-driven project management, evolved from a wide range of

  - **Earlier management practices,**
  - **Manufacturing productivity enhancement efforts,**
  - **Quality-improvement efforts, and**
  - **Project management methodologies**

# Introduction

- Customer-driven management is designed to focus on striving for success in project delivery through *total customer satisfaction.*

# Foundation of Project Management



- During World War II, traditional management approaches proved deficient in integrating the many aspects of the development and production of complex weapon systems.

- After World War II, the need to manage large, complex undertakings increased the interest in project management approaches.

# Foundation of Project Management

- In the early 1950s, project management started to evolve into a more systematic approach to completing pro- grams.

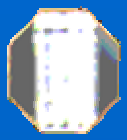
- In the 1960s, project management began to be implemented in many organizations besides those in defense, space, and construction industries.

# Foundation of Project Management

- By the 1970s, project management was recognized as an established management approach for many organizations involved in government, education, and private endeavors.

- Technology, especially automation and telecommunications, has allowed project management techniques to expand in breadth and scope.

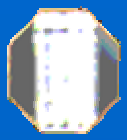
# What project management is



- *Project management* is the management of an activity that has a defined start and finish.

- The objective in project management is to complete the project before or on *time*, at or below *cost*, and within technical *performance specifications*.

# What project management is



- Project management can be called :
  - ***Program management*, ( department of defense)**
  - ***Product management*, (commercial industry)**
  - ***Construction management* ( building industry)**

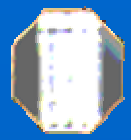
in relation to the major areas where it is used.

# Project management-Uniqueness

Project management is unique because of the following:

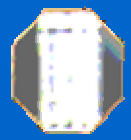
- It has a defined specification, deliverable, and end point.
- It borrows and integrates resources.

# Time, cost, and performance trade-offs



- Traditionally, there are three factors that are key to the success of project management ; *Time*, *Cost* and *Performance*.

# Time, cost, and performance trade-offs



Each of these factors is fundamental to successful project management:

- Completion of the project within allocated resources (*cost factor* ).
- Completion of the project within allocated schedule (*time factor ).*
- Completion of the project within explicit criteria, standards, and specifications (*performance factor* , *Quality factor* ).

# Time, cost, and performance trade-offs

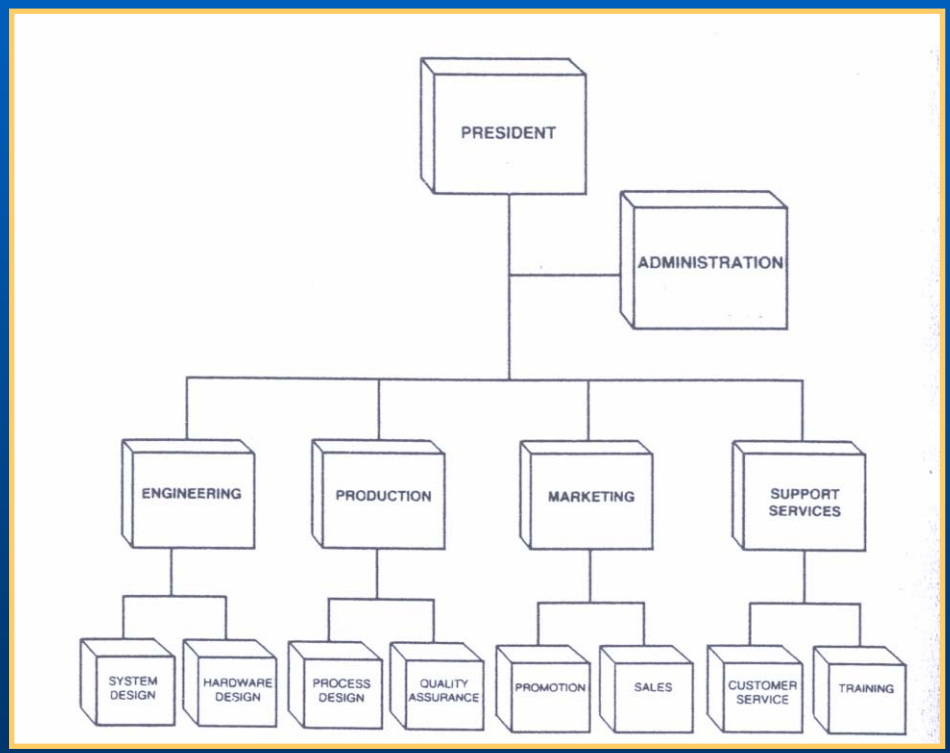
- Traditionally, the project management organization focuses on planning and controlling time and cost while assuming that its functional departments will ensure quality through a focus on specifications.

# Matrix organization

- Project management relies on the specialties in each one of many functions at varying times during the project.
- This requires a matrix organization to share resources between both functional management and project management.

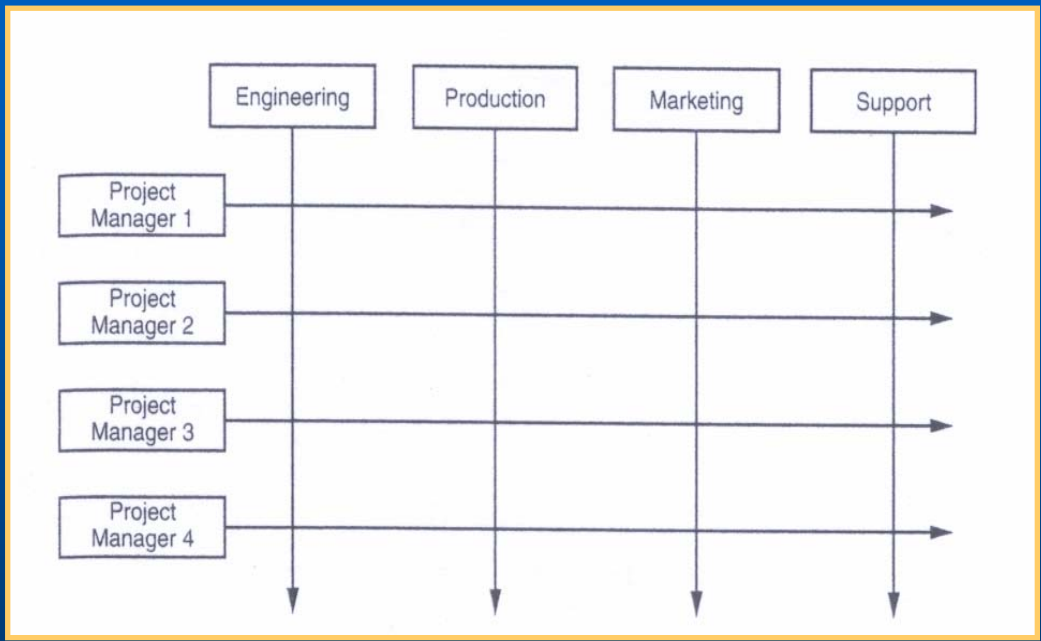
# Matrix organization

## Traditional Functional Organization



# Matrix organization

## Matrix Organization



# Matrix organization

- In a matrix organization, the project managers use resources (people, equipment, materials) from the functional organizations as necessary.

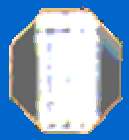
- In a matrix organization, responsibility, authority, and resources flow vertically through the functional organization and horizontally from the project managers.

# Matrix organization

- Project management recognizes that successful work in an organization is not guaranteed, or even facilitated, by a traditional organization structure.

- Therefore it emphasizes communication and coordination of effort among functional departments like planning, engineering and marketing.

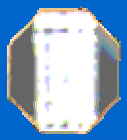
# Project management philosophy



The project management philosophy incorporates the following fundamental beliefs:

- **The project is the primary focus for organizational activity, with specifications and project tasks driving the work.**
- **Resources and responsibility can be shared between the functional organization and the project.**
- **The organization's matrix team completes projects on time and within cost and performance specifications.**
- **Planning and control are the principal techniques for achieving the project objectives.** **Contd..**

# Project management philosophy



- Technology is usually the main method to make improvements. .Coordination of all project activities is the key to effective use of resources.
- Teams in a matrix are the organizational structure for project management.
- Authority, responsibility, and resources can be spread throughout the functional and project organization.

contd..

- Numerous product lines and projects can be managed at the same time.
- An adequate reservoir of functional specialists can be maintained.
- Growth is encouraged through the project management process.

# Project management principles

The project management principles are to:

- **Provide a project focus**
- **Reward production**
- **Involve functional organizations**
- **Nurture rapid technological change**
- **Control and plan all activities**
- **Include authority and resources with responsibility**
- **Provide time, cost, and quality objectives**
- **Let functional organizations perform processes .**
- **Encourage teamwork and cooperation .**
- **Satisfy the customer**

# Project management cycles

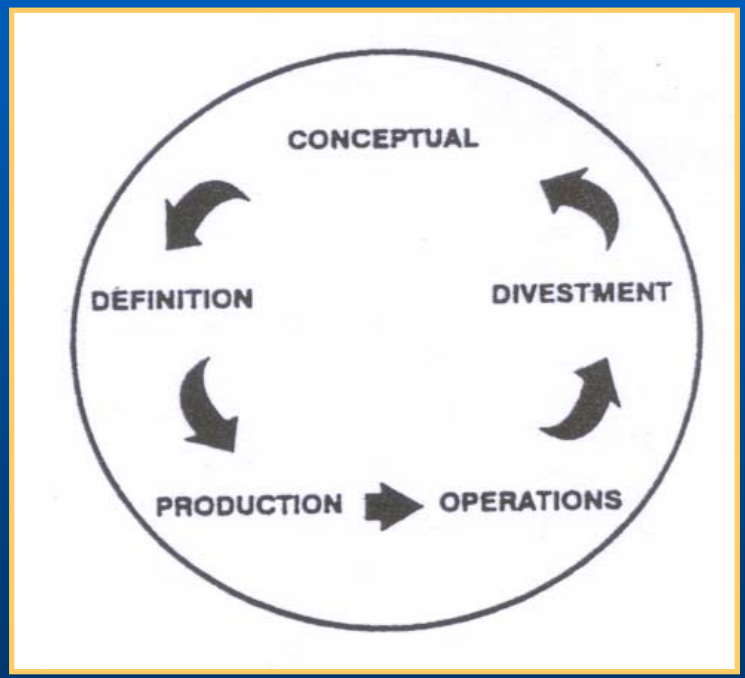
- Project management involves a cycle of processes. These cycles for *defining*, *designing*, *developing*, and *delivering* a deliverable vary by organization.

- A generic project management life cycle involve the following functions:

  - **Conception**
  - **Definition**
  - **Production**
  - **Operation**
  - **Divestment**

# Project management cycles

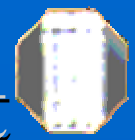
Five phases of project life cycle



# Project management cycles

- Within the Department of Defense, the project management cycle is described as the seven-phase acquisition cycle.
  - **Pre concept**
  - **Concept**
  - **Demonstration and validation**
  - **Full-scale development**
  - **Production**
  - **Deployment and operations**
  - **Disposal**

# Foundation of Total Quality Management



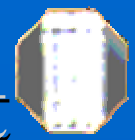
- Total quality management (TQM) has it foundation in the quality movement.
- The quality movement began with the application of statistics process/quality control by Dr. Walter A. Shewhart after World War I.

# Foundation of Total Quality Management

- Further the quality movement was stimulated by Japan with the assistance of U .S. quality experts.

- Deming one of the experts showed the Japanese how they could improve quality and productivity through statistical techniques to capture more business and create jobs.

# Foundation of Total Quality Management



## 14-point approach to quality by Deming:

1. **Create and publish to all employees a statement of the aims and purposes of the company or other organization.**

2. **Learn the new philosophy-top management and everybody.**

3. **Understand the purpose of inspection for improvement of process and reduction of cost.**

4. **End the practice of awarding business on the basis of price tag alone.**

# Foundation of Total Quality Management

5. Improve constantly and forever the system of production and service.

6. Institute training.

7. Teach and institute leadership.

8. Drive out fear. Create trust. Create a climate for innovation.

9. Optimize toward the aims and purposes of the company the efforts of teams, groups, staff areas.

10. Eliminate exhortations for the workforce.

# Foundation of Total Quality Management

11. (a) Eliminate numerical quotas for production.
    (b) Eliminate management by objectives (MBO).

12. Remove barriers that rob people of pride in their work.

13. Encourage education and self-improvement for everyone.

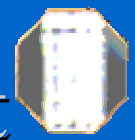
14. Take action to accomplish the transformation.

# Foundation of Total Quality Management

- Others who also assisted the Japanese in pursuing their "quality" vision during the succeeding decades after World War II are
  - **Joseph M. Juran,**
  - **Armand V. Feigenbaum,**
  - **Kaoru Ishikawa, and**
  - **Genichi Taguchi.**

- Both Juran and Deming stressed traditional management as the "root" cause of quality and productivity issues.

# Foundation of Total Quality Management



- Armand v Feigenbaum's approach involved a systematic, integrated, organization wide perspective. He also originated the concept of the *cost of quality*, which monitored *cost of failures*, *quality appraisal*, and *prevention costs*.

- Kaoru Ishikawa, stressed the seven basic tools of quality. These tools include *Pareto charts*, *cause-and-effect diagrams*, *stratification*, *check sheets*, *the histogram*, *scatter diagrams*, and *control charts*. :

# Foundation of Total Quality Management

- Genichi Taguchi redefined the concepts of design specification. According to him being within specifications is not good enough, any variation of performance from best target value is a loss, and loss is the enemy of quality.

- The next stage of the quality movement started in the United States in the late 1970s. During which, the threat of competition from many other countries became apparent to many U.S. industries.

# Foundation of Total Quality Management

- An early proponent in the late 1970s, Philip B. Crosby outlined the "zero defects". The Crosby approach is based on four points:

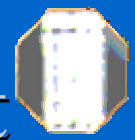
  - **Quality is conformance to requirements;**
  - **Prevention is the key to quality;**
  - **Zero defects is the standard; and**
  - **Measurement is the price of non- conformance.**

# Foundation of Total Quality Management

- In the early 1980's Tom Peters and Robert H. Waterman Jr., presented an initial inside look at what made the companies so competitive. They determined eight attributes that distinguish excellent, innovative companies.

1. **They preferred to do some- thing rather than going through endless analysis and committee reports**
2. **Strove continuously to meet the needs and expectations**
3. **Structured with smaller organizations within, allowing internal autonomy**
4. **Ability to increase productivity through people.**

# Foundation of Total Quality Management



5. Value driven through management setting the example
6. Organizational strength by sticking to what they did best.
7. Few layers of management and few people in each j layer
8. Atmosphere of dedication to the primary values of the company and a tolerance for all employees

# Foundation of Total Quality Management

- In 1987, the need for quality improvement was formally recognized by many industry leaders and the U.S. government with the creation of the *Malcolm Baldrige National Quality Award.*

- The annual award recognizes U .S. companies in the categories of manufacturing, service, and small business that excel in quality achievement and quality management.

# Foundation of Total Quality Management

*Malcolm Baldrige National Quality Award's* criteria for

- Leadership,
- Information and analysis,
- Strategic quality planning,
- Human resource utilization,
- Quality assurance of products and services,
- Quality results, and
- Customer satisfaction

and have been improved continuously since its inception.

# What total quality management is?

- Although there are many applied definitions of total quality management, the basic essence of TQM involves the elements of *continuous improvement*, a *people orientation*, *quantitative methods*, and a *focus on customer satisfaction.*

- TQM is the application of *quantitative methods* and *human resources* to improve the material services supplied to an organization

# What total quality management is?

Definition:

- TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach focused on continuous improvement (*Draft Department of Defense*).

- TQM is a strategic, integrated management system for achieving customer satisfaction which involves all managers and employees and uses quantitative methods to continuously improve an organization's processes. (*The Federal Quality Institute*)

# What Total Quality Management Is?

## Understanding of TQM

- *Total* in this context means the involvement of everyone and everything in the organization.
- *Quality* is total customer satisfaction.
- *Management* means creating and maintaining the TQM environment.

# Total Quality Management Philosophy

- The TQM philosophy stresses a systematic, integrated, consistent, organization wide perspective involving everyone and everything.

- It focuses primarily on total customer satisfaction (both the internal and external customers) within a management environment that fosters continuous improvement of all systems and processes.

# Total Quality Management Philosophy

The philosophy values

- **Empowering people**
- **Stresses optimal life-cycle cost**
- **Target improvements**
- **Prevention of defects and quality in design are key elements of the philosophy**
- **Elimination of losses and reduction of variability**
- **Developing relationships: internal, supplier, and customer**

- Finally, the philosophy is based on an intense to desire succeed.

# TQM Guiding Principles

The TQM guiding principles involve continuously performing the following actions:

- Provide a TQM environment.
- Reward and recognize appropriate actions.
- Involve everyone and everything.
- Nurture supplier partnerships and customer relationships-
- Create and maintain a continuous-improvement system.
- Include quality as an element of design. Contd..

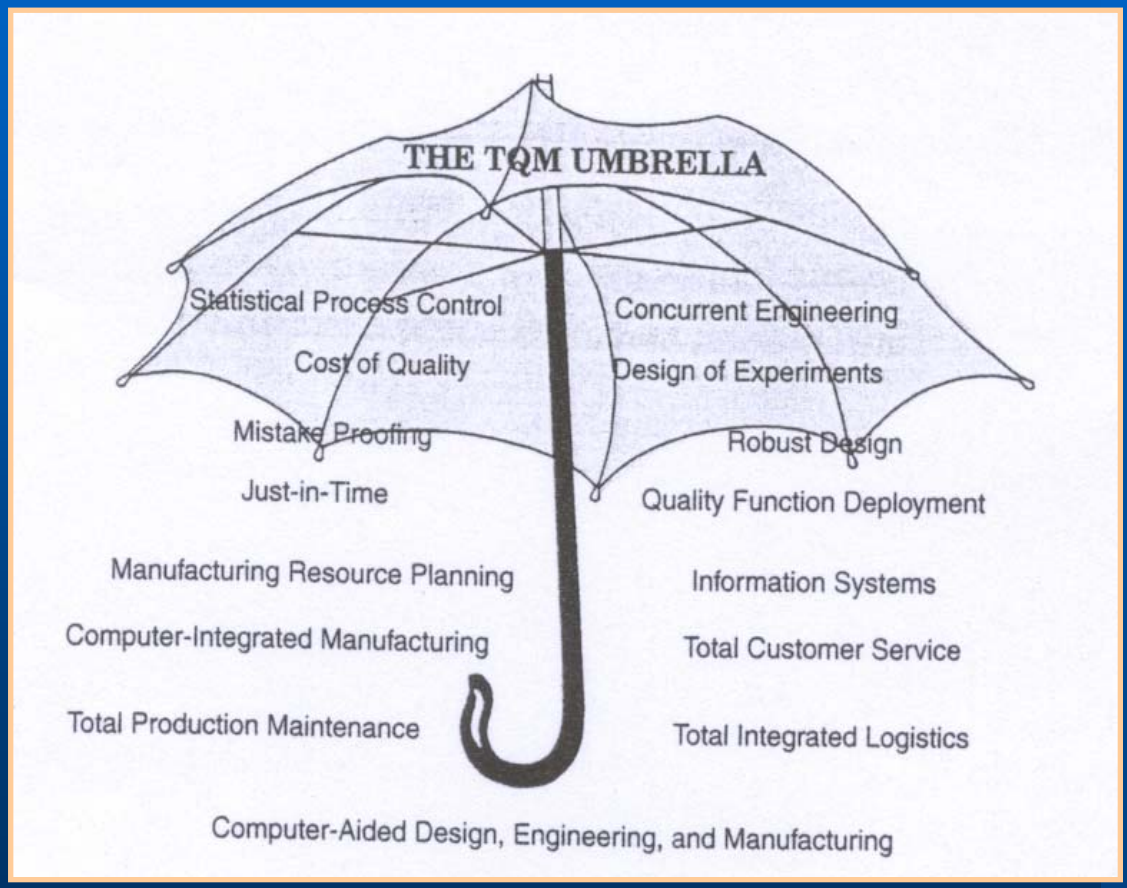
# TQM Guiding Principles

- Provide training and education constantly.
- *Lead* long-term improvement efforts geared toward prevention.
- Encourage cooperation and teamwork.
- Satisfy customers (both internal and external).

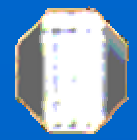
# The TQM Umbrella

- The TQM umbrella includes the integration of all the fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach focused on continuous improvement.

# The TQM Umbrella



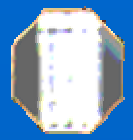
# TQM, A Unique Management Approach



- TQM is a people-oriented, measurement-driven, customer-focused, long-term, strategically oriented management philosophy using a structured, disciplined, continuous-improvement operating methodology.

- It is not a "quick fix" using firefighting techniques.

# TQM, A Unique Management Approach



- With TQM, management must systematically select the long-term continuous improvement efforts.
- TQM focuses on "doing the right thing right the first time." This emphasizes prevention of errors and quality of the design.
- TQM bases decisions on facts instead of opinions, as traditional management often does.

# TQM, A Unique Management Approach

| Traditional management | Total quality management |
|---|---|
| Looks for a "quick" fix | Adopts a long-term, strategically oriented philosophy |
| Firefights without an analytic component | Uses a disciplined methodology of continuous improvement |
| Operates the same old way with a commitment to stability | Advocates breakthrough, innovation, and creative thinking |
| Adopts improvement randomly | Systematically selects improvement |
| Inspects for defects and errors | Focuses on prevention |
| Decides by using opinions | Decides by using facts |
| Throws money and technology at tasks | Maximizes people resources |
| Controls resources by function | Optimizes resources across the whole organization |
| Controls people | Empowers people |
| Targets individual performance to meet job description requirements | Focuses on team performance to meet customer expectations |
| Is primarily motivated by profit | Strives for total customer satisfaction |
| Relies on programs | Is a never-ending process |

# The Total Quality Management Process

- The TQM process transforms all the inputs in the organization into a product and/or ser- vice that satisfies the customer.
- The most important inputs include the wants, desires, needs, expectations, and requirements of the customer.
- The output of the process is increased financial performance, improved operating procedures, better employee , relations, and greater customer satisfaction.

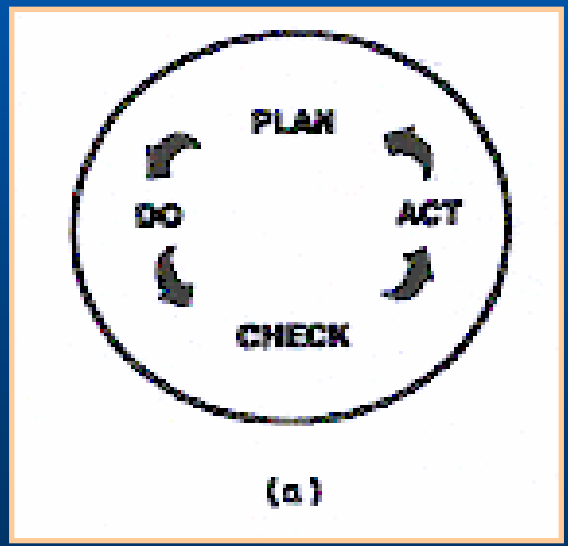
# The Total Quality Management Process

TQM Process

# TQM Methodology

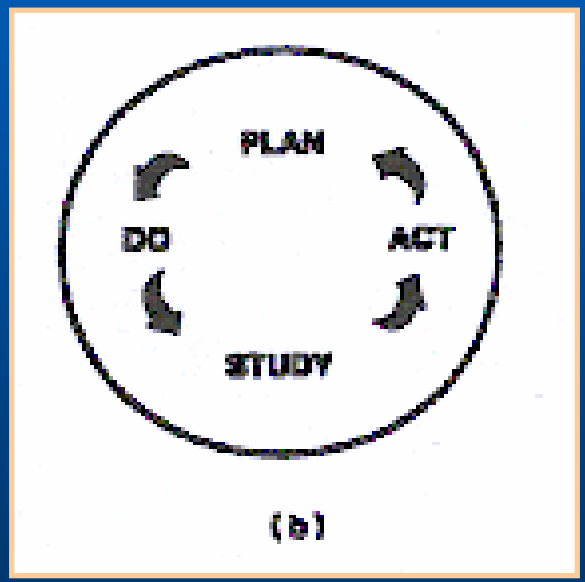
- The TQM methodology involves a disciplined continuous improvement approach.

a. Shewart/Deming cycle (PDCA)



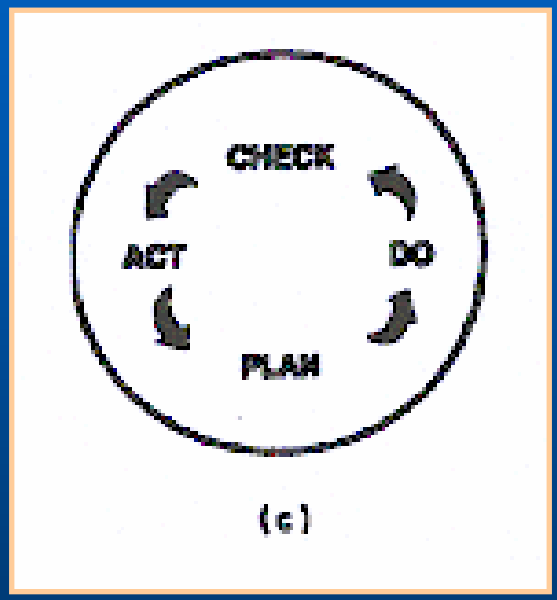
# TQM Methodology

b. Plan, Do, Study and Act cycle (PDSA)



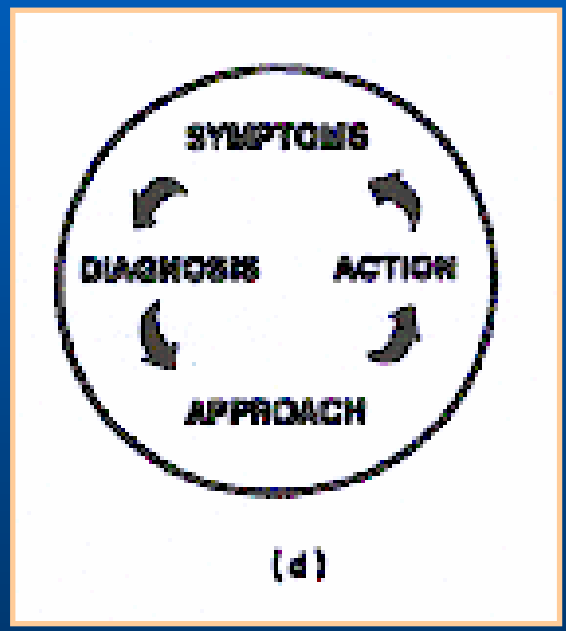
# TQM Methodology

c. Check, Act, Plan and Do cycle.



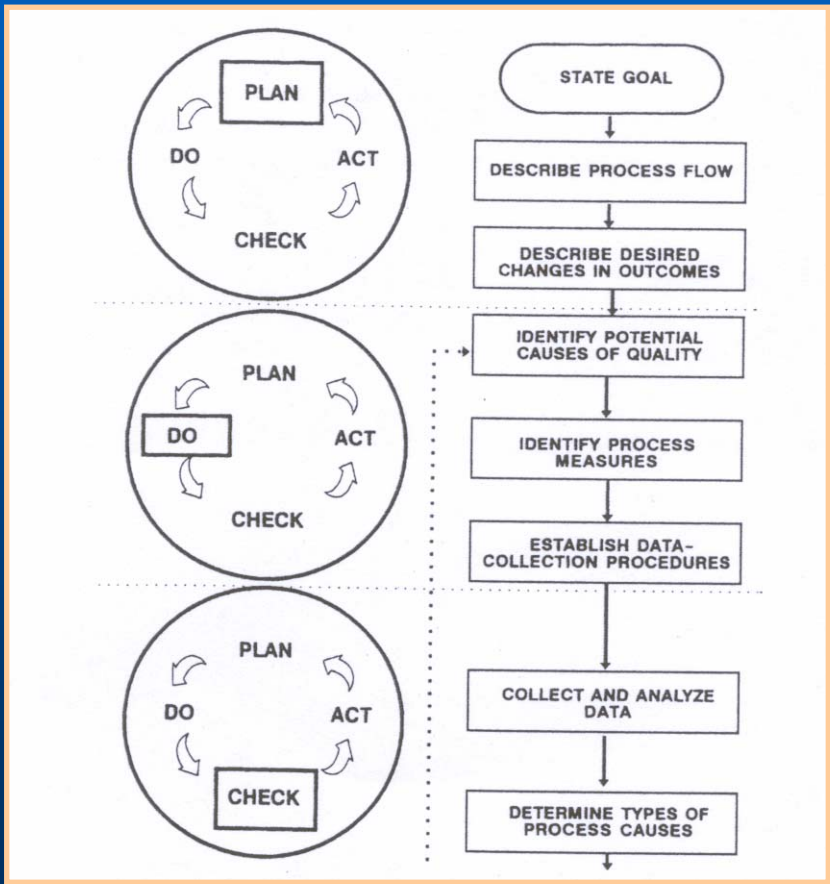
# TQM Methodology

d. Symptoms, Diagnosis, Approach and Action cycle.



# TQM Methodology

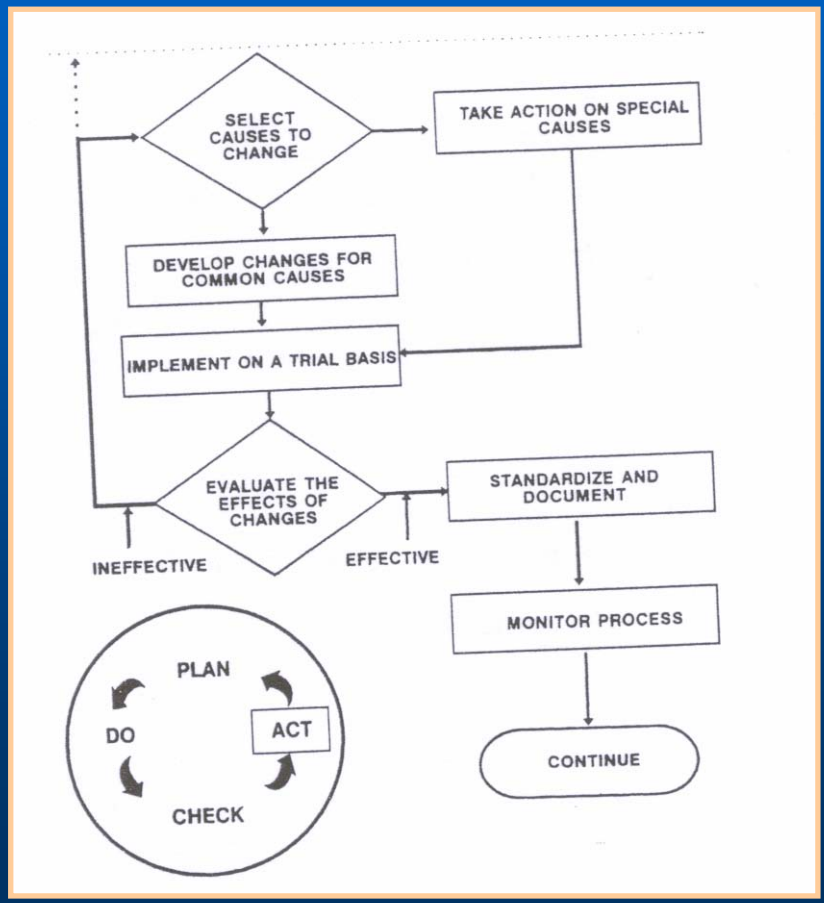
- In many organizations, the basic PDCA cycle is expanded into detailed activities.




TQM methodology example

Fig: Contd..

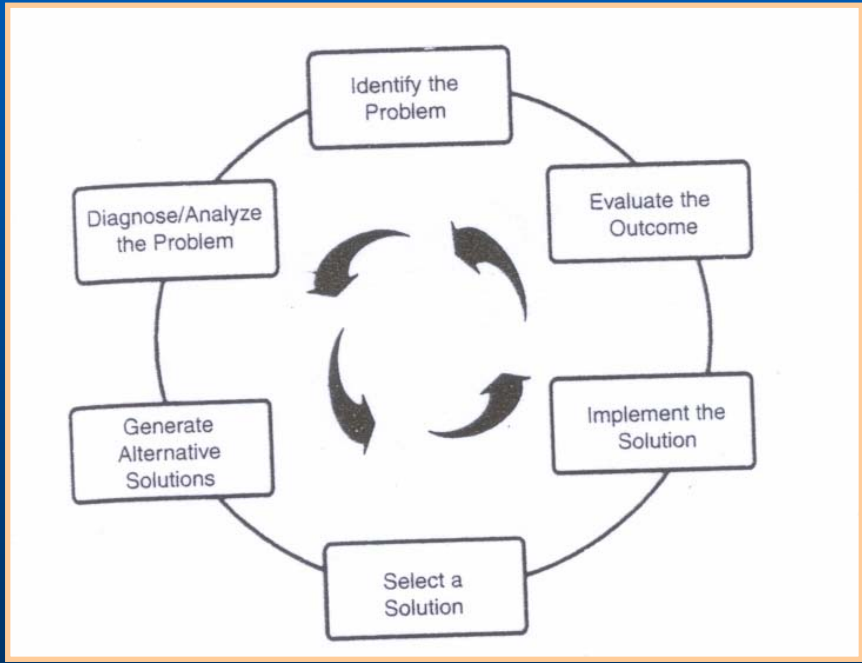
# TQM Methodology




TQM methodology example

# TQM Methodology

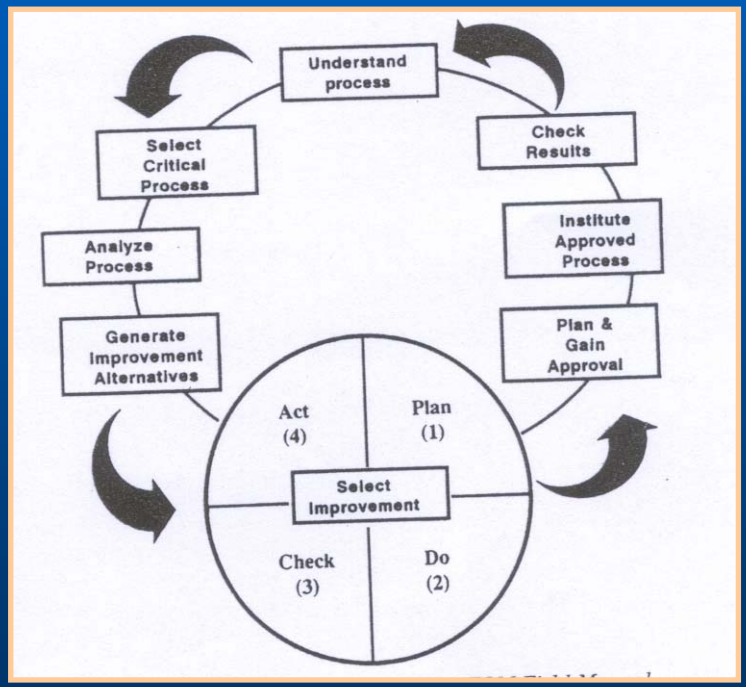
- Another common approach is the basic problem-solving model




Problem solving methodology

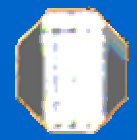
# TQM Methodology

- Eight step approach similar to eight step customer driven project management methodology.




Typical TQM methodology from TQM field manual

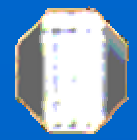
# Why Integrate Project Management and TQM



- Project management and total quality management together provide an approach to adapt to the global economic environment of the 1990s and beyond.

- Project management provides the management techniques for delivering a project, program, process, task, or activity.

# Why Integrate Project Management and TQM



- TQM furnishes the environment for selection and continuous improvement of the right project, program, process, task, or activity.

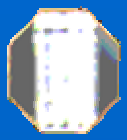
- In combination they provide systematic, disciplined, flexible, adaptable, approach for producing deliverables, improving organizational performance and moving towards continuous improvement focused on customer satisfaction

# Project Quality Management

- The full integration of the quality movement and project management comes in the form of project quality management.

- Project quality management is the process of integrating and managing quality into the core project management process rather than using quality tools simply to inspect and appraise the work after the fact.

# Project Quality Management



- PMI has identified six key components of project quality management

  - **The quality movement,**
  - **Quality planning concepts,**
  - **Quality assurance,**
  - **Quality control,**
  - **Continuous process improvement, and**
  - **Future quality issues and opportunities.**

# Creating Quality Organization in the New Millennium

- Creating an organization that inspires individual project quality and professionalism will require new energy and new strategies.

- Five forces will shape the future quality organization
  - **Serious rededication to the work ethic and the individual will**
  - **Flexible organizational structure with purpose and direction**
  - **Full-cycle customer involvement**
  - **Embedded quality and the slow disappearance of a separate quality culture**
  - **The coming of age of the Internet**

# Chapter 5
# Leadership and Quality