

A photograph of a road construction site. In the foreground, three men are standing on a gravel surface. The man on the left is wearing a light-colored jacket over a red t-shirt and grey trousers. The man in the center is wearing a light-colored shirt, dark trousers, a cap, and gloves, and is holding a black bucket. The man on the right is wearing a light-colored shirt, dark trousers, and a blue beret. In the background, there is a blue car with a license plate that reads '2393', a yellow excavator, and a large orange truck. There are also piles of stones and tires on the left side of the road.

Project Quality Management

What is quality? (ISO 8402)

- The totality of features and characteristics of a product or service that bear upon its ability to satisfy stated or implied needs.

Other definitions

- **Fitness for purpose or use (Juran)**
- **Conformance to requirements (Crosby)**



What the
customer
really needed

Which is a quality?



- A high cost product or services?
- What product or services that I am dreaming for?
- What I require now?, or
- Within the time and cost that I can afford, what I can have?

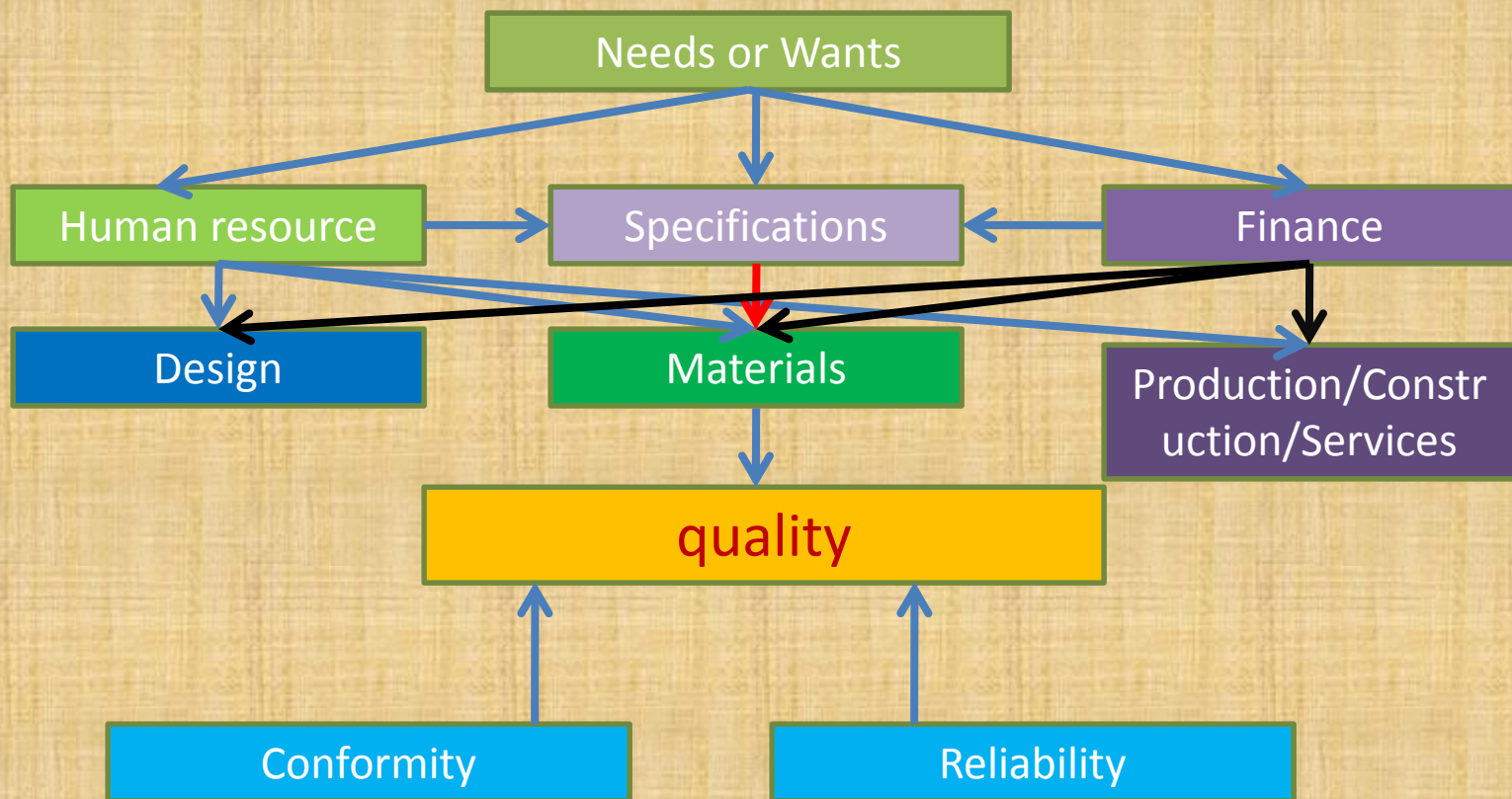
Common misconceptions

1. Quality is difficult to define, but you can recognize it when you see it
2. Quality is expensive
3. Quality is craftsmanship
4. Quality is luxury
5. Quality is in short supply

Quality Gurus

- Dr Edward Deming
 - Total Quality Management
 - Plan-Do-Check-Act
 - Rule of 85
 - 85% of the cost of quality is responsibility of Management
- Dr Joseph Moses Juran (Quality Planning, Quality Control, Quality Improvement)
- Phillip Crosby (Conformance to Requirements, Prevention, Zero Defect, Cost of Non _conformance)

Quality Determinants



Basics of QA/QC program

- QA/QC involves developing a “mind-set” on quality as an essential element to optimum and flawless performance. (*American and Japanese mind set*)
- Assurance of quality is deemed to have been established in a project when standard practices and procedures of quality control are in-built as an integral part of the methods and procedures of project implementation and institutionalized within an organization.

Quality management

- All **control** and **assurance** activities instituted to achieve the quality established by the contract requirements.



Total Quality Management (TQM)

- Total – made up the whole
- Quality – Degree of excellence a product or service provides
- Management – Act, art or manner of handling, controlling, directing etc.

TQM

Basic approach

1. A committed management
2. Focused on customer
3. Involvement and utilization of the total work force
4. Continuous improvement
5. Treating suppliers as partners
6. Establish performance measures for each components/ persons

TQM

Tools and techniques

1. Bench marking
2. Information technology
3. Quality management systems
4. Environment management system
5. Quality function deployment (Customer requirements led design)

6. Quality by design
7. Failure mode analysis (Reliability)
8. Product liability
9. Total productive maintenance
10. Management tools
11. Statistical process control

Kaizen

- **Kaizen**, Japanese for "improvement", or "change for the better" refers to philosophy or practices that focus upon continuous improvement of processes in manufacturing, engineering, and business management.
- The cycle of kaizen activity can be defined as:
 - Standardize an operation and activities.
 - Measure the operation (find cycle time and amount of in-process inventory)
 - Gauge measurements against requirements
 - Innovate to meet requirements and increase productivity
 - Standardize the new, improved operations
 - Continue cycle *ad infinitum*

- Just In Time
 - Zero Inventory Cost
 - Beat the Cost
- Lean Production
 - An integrated view of TQM, Kaizen, JIT
 - Economical, Efficient and Not Wasteful, Effective and Defect Free Production
 - Lean means less head count, less space, less inventory, less cost, less defects and moderately agile management system

Improving IT Quality Management

- Leadership that Promotes Quality
- Develop Awareness on Cost of Quality
- Focusing on Organizational influences and workplace factors
- Following Maturity Models

Project Management Maturity Model

- Ad-Hoc
- Abbreviated
- Organized
- Managed
- Adaptive

Quality Planning

- Expected Level of Quality can only be achieved through necessary quality planning during project initiation
- Attributes of Quality Requirements
 - Completeness Criteria
 - Correctness Criteria
 - Usefulness Criteria

Quality assurance

- The system to make certain the Quality Control is functioning and the specified end product is realized.



Activities to be performed for QA/QC

1. Prepare a written QA organizational plan
2. Site, location or receivable planning
3. Identify training needs for clear understanding of QA/QC responsibilities among office and field staff
4. Review work loads and staffing needs

QA/QC program for design phase

- Use standard design criteria
- Cost estimate
- Contract packaging
- Preparation of work schedule
- Prepare standard contract document
- Tendering process
- Bid evaluation and award



QA/QC program for Implementation phase

- Supervision and QC
- Progress reporting
- Measurements and payments
- Corrective actions
- Training for Operation and maintenance

Quality assurance plan

1. The quality control descriptions – acceptance/rejection
2. List of sources of materials
3. List of tests
4. Spot, sequence, activity and time for inspection

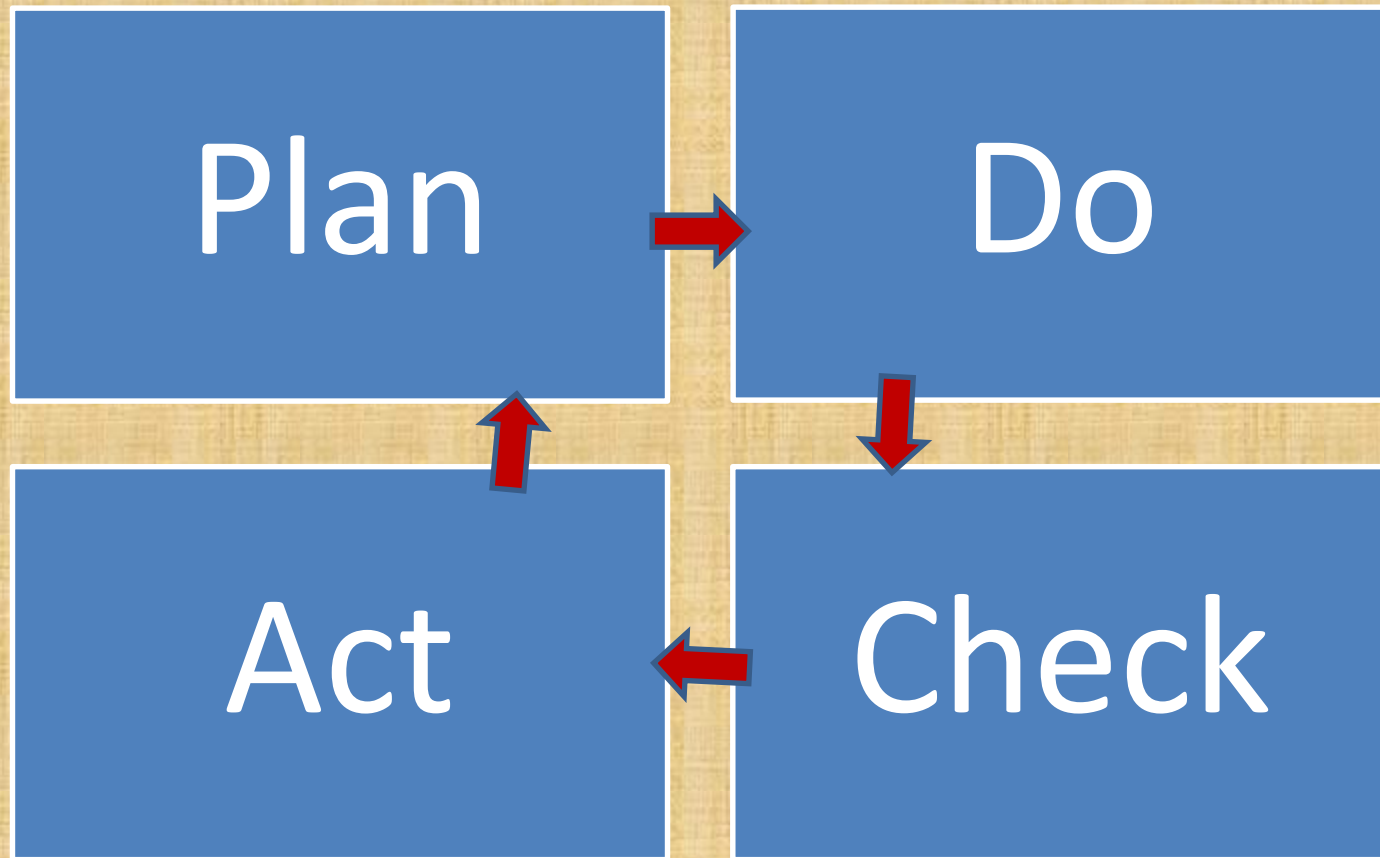
Exercise

Quality assurance plan

Activity/ material	Activities involved/ special features	Inspection /test required	Frequency and dates	Who is responsible for inspection/test report preparation	Who is responsible for control

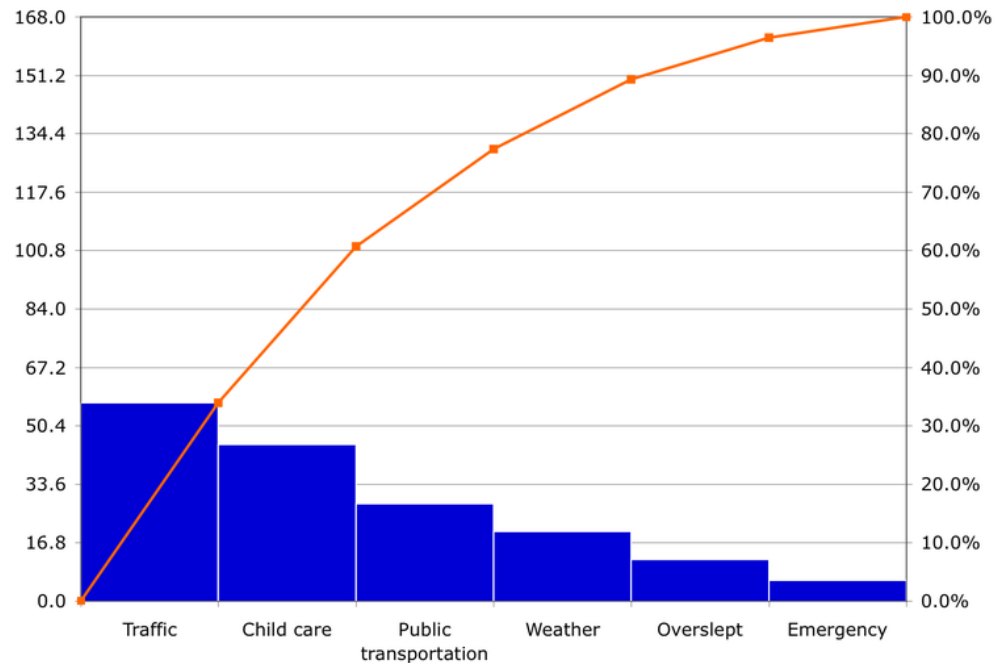


PDCA Cycle



Quality Control Charts

Pareto Chart of Late Arrivals by Reported Cause



Pareto Chart is a type of chart that contains both bars and a line graph, where individual values are represented in descending order by bars, and the cumulative total is represented by the line.

Quality Charts

- Control Charts
- Flowcharting
- Histogram
- Pareto Chart
- Run Chart
- Scatter Diagram

Testing Of IT Systems

- Unit Test
 - To test each individual component to ensure they are defect free
- Web Test
 - Series of HTTP request for testing websites
- Integration Testing
 - Occurs between unit and system testing to test functionally grouped components
- System Testing
 - Tests entire system as one entity
- Load Testing
 - Used for stress testing for various load setting, network type and client configurations
- User Acceptance Testing
 - Performed by the end user prior to accepting the delivered system



End of This Part

Reference

- Dr Rajendra Adhikari, MSTIM, IOE, Project Management Lecture Slides