



Everyone's Smart
University

Advanced Project Management

LECTURE 2



PMG 506

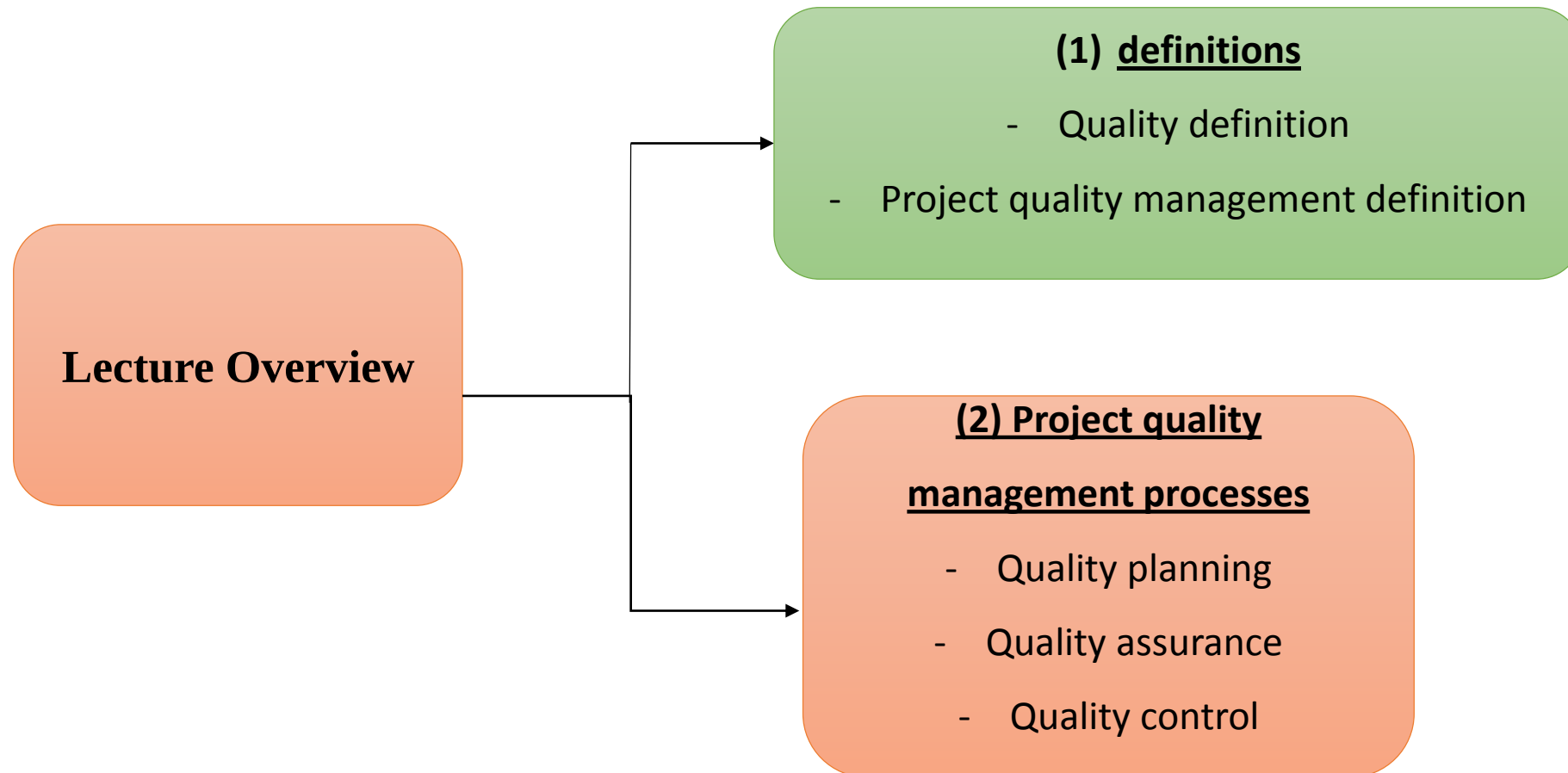
Project Quality Management

Learning Outcomes



- **At the end of this lecture students will be able to:**
- **Explore the various definitions of quality and project quality management.**
- **Understand the importance of project quality management.**
- **Define project quality management and understand how quality relates to various aspects of projects.**
- **Explore the Project Quality Management Processes.**
- **Describe quality planning and its relationship to project scope management.**
- **Discuss the importance of quality assurance.**
- **Explore the three outputs of the quality control process.**

Lecture Overview



What Is Quality?

- The International Organization for Standardization (ISO) **defines quality as** the totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs.
- **Other experts define quality based on.**
 - **conformance to requirements:** meeting written specifications.
 - **fitness for use:** ensuring a product can be used as it was intended.

Project Quality Management



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Project Quality Management includes the processes & activities that determine quality policies, objectives & responsibilities to ensure that the project satisfies the needs for which it is undertaken.

Project Quality Management Definition

A subset of project management that includes the processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken.

Project Quality Management Processes

- 1. Quality planning:** identifying which quality standards are relevant to the project and how to satisfy them
- 2. Quality assurance:** evaluating overall project performance to ensure the project will satisfy the relevant quality standards
- 3. Quality control:** monitoring specific project results to ensure that they comply with the relevant quality standards while identifying ways to improve overall quality

Project Quality Management Summary

Planning

Process: **Quality planning**

Outputs: Quality management plan, quality metrics, quality checklists, process improvement plan, quality baseline, updates to the project management plan



Executing

Process: **Quality assurance**

Outputs: Requested changes, recommended corrective actions, updates to organizational process assets and the project management plan



Monitoring and Controlling

Process: **Quality control**

Outputs: Quality control measurements, validated and recommended defect repair, recommended corrective and preventive actions, requested changes, validated deliverables, and updates to the quality baseline, organizational process assets, and the project management plan



Project Start

Project Finish



1. Quality Planning

Implies the ability to anticipate situations and prepare actions to bring about the desired outcome.

- **Important to prevent defects by:**

- **Selecting proper materials.**
- **Training and indoctrinating people in quality.**
- **Planning a process that ensures the appropriate outcome.**

1. Quality Planning

Quality planning: identifying which quality standards are relevant to the project and how to satisfy the.

1. Quality Planning

It is important to design in quality and communicate important factors that directly contribute to meeting the customer's requirements.

Design of experiments helps identify which variables have the most influence on the overall outcome of a process.

Quality Planning Flowchart



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Inputs

- .1 Scope baseline
- .2 Stakeholder register
- .3 Cost performance baseline
- .4 Schedule baseline
- .5 Risk register
- .6 Enterprise environmental factors
- .7 Organizational process assets

Tools & Techniques

- .1 Cost-benefit analysis
- .2 Cost of quality
- .3 Control charts
- .4 Benchmarking
- .5 Design of experiments
- .6 Statistical sampling
- .7 Flowcharting
- .8 Proprietary quality management methodologies
- .9 Additional quality planning tools

Outputs

- .1 Quality management plan
- .2 Quality metrics
- .3 Quality checklists
- .4 Process improvement plan
- .5 Project document updates

Quality Planning Inputs



1. Scope Baseline.

- **Scope statement:** contain details of technical issues and other concerns.

Quality Planning Inputs



2. Stakeholder Register.

- Identifies stakeholders with a particular interest in, or impact on, quality.

3. Cost performance Baseline.

- Documents the accepted time phase used to measure cost performance.

4. Schedule Baseline.

Documents the accepted schedule performance measures including start and finish dates.

Quality Planning Inputs

5. Risk register.

- Threats and opportunities.

6. Enterprise Environmental Factors.

- Governmental agency regulations.
- Rules, standards & guidelines.
- working / operating conditions.

Quality Planning Inputs

7. Organizational process assets.

- Organizational quality policies, procedures & guidelines.
- Historical databases.
- Lessons learned from previous projects.
- Quality policy.

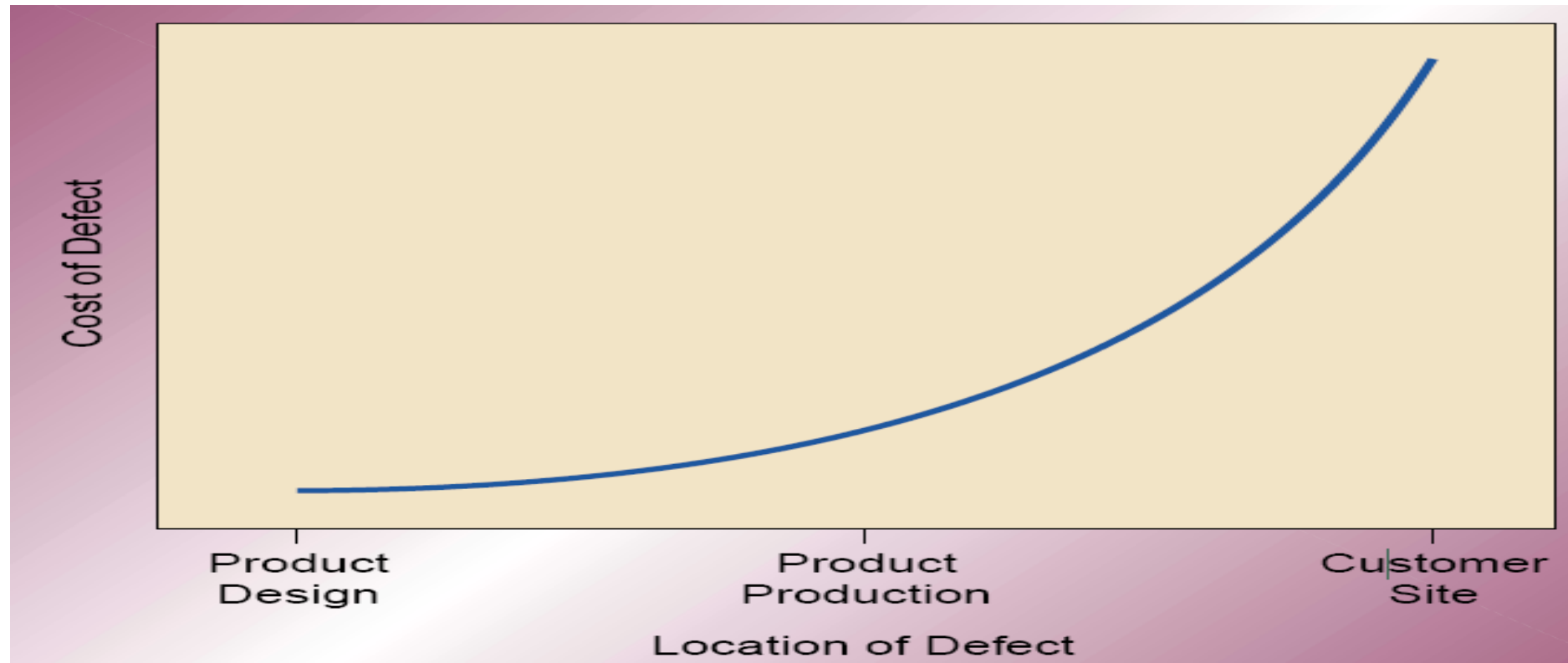
Tools and Techniques for Quality Planning

1. Cost / Benefit analysis.

- The planning process must consider benefit/cost tradeoffs.
- **The Primary Cost:** Is the expenses associated with PQM activities.
- **The Primary Benefit:** Is less work, higher productivity, lower costs, and increased stakeholder satisfaction.

Tools and Techniques for Quality Planning

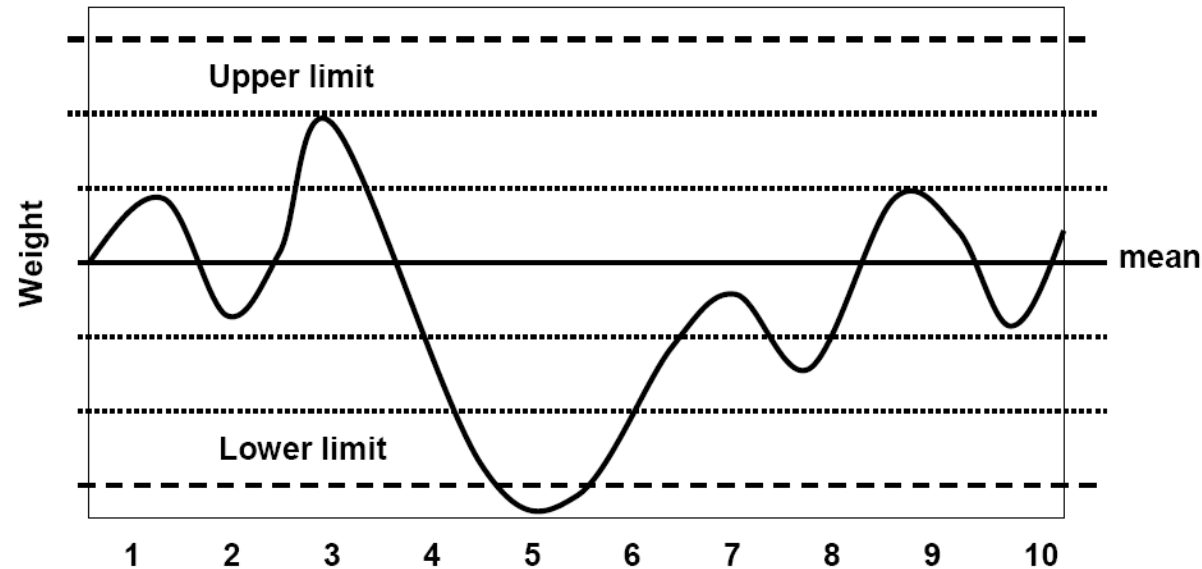
2. Cost of Quality (COQ).



Tools and Techniques for Quality Planning

3. Control charts.

- To determine whether or not a process is stable or has predictable performance.



Tools and Techniques for Quality Planning

4. Benchmarking.

- **Benchmarking involves comparing actual or planned project practices to those of other projects to generate ideas to:**

1- Generate ideas for improvement.

2- provide a standard for measurement of performance.

Tools and Techniques for Quality Planning

5. Design of Experiments DOE.

- **Aims to define variables that have most influence on the overall outcome.**
- **Commonly applicable to the product of the project issues.**
- **Used in project management issues such as cost and schedule tradeoffs to allow for optima solutions.**

Tools and Techniques for Quality Planning

6. Statistical Sampling.

- **Choosing part of a population of interest for inspection.**
- **Sample frequency and sizes should be determined during the plan quality process.**

Tools and Techniques for Quality Planning

7. Flowcharting.

- The flowcharting techniques in quality management generally include:
 - cause and effect diagram.
 - System or process flow charts.
- Flowcharting can help in anticipating probable quality problems and thus helps to develop approaches for dealing with them.

Tools and Techniques for Quality Planning

8. Quality Management Methodologies.

- Six Sigma, Lean Six Sigma, Quality Function Deployment, etc



Tools and Techniques for Quality Planning

9. Additional Quality Planning Tools.

- **Brainstorming.**
- **Affinity diagrams.**
- **Nominal group techniques.**
- **Matrix diagrams.**
- **Prioritization matrices.**
- **Force field analysis.**

Outputs from Quality Planning

1. Quality Management Plan.

- The Quality Plan should address:
 - Quality Control of the project.
 - Quality Assurance.
 - Quality Improvement of the project.

Outputs from Quality Planning



2. Quality Metrics.

- On-time performance, budget control, defect frequency, failure rate, availability, reliability and test coverage.

3. Quality checklists.

- A structured tool used to verify that a set of required steps or requirements have been performed.

Outputs from Quality Planning

4. Process Improvement Plan.

- Process boundaries.
- Process configurations.
- Process metrics.
- Targets for improved performance.

Outputs from Quality Planning



5 Project Document Updates.

- Stakeholder register.
- Responsibility Assignment Matrix.

2. Quality Assurance

- **Quality assurance** includes all the activities related to satisfying the relevant quality standards for a project.
- Another goal of quality assurance is continuous quality improvement.

2. Quality Assurance

Benchmarking generates ideas for quality improvements by comparing specific project practices or product characteristics to those of other projects or products within or outside the performing organization.

2. Quality Assurance

- **A quality audit** is a structured review of specific quality management activities that help identify lessons learned that could improve performance on current or future projects.
- Performed by in-house auditors or third parties.

2. Quality Assurance

- **Process of auditing the quality requirements and the results from quality control measurements to ensure appropriate quality standards and operational definitions are used.**
- **Continuous process improvement reduces waste and eliminates activities that do not add value.**

2. Quality Assurance

Quality assurance: evaluating overall project performance to ensure the project will satisfy the relevant quality standards.

Quality Assurance Flowchart



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Inputs

- .1 Project management plan
- .2 Quality metrics
- .3 Work performance information
- .4 Quality control measurements

Tools & Techniques

- .1 Plan Quality and Perform Quality Control tools and techniques
- .2 Quality audits
- .3 Process analysis

Outputs

- .1 Organizational process assets updates
- .2 Change requests
- .3 Project management plan updates
- .4 Project document updates

Inputs To Quality Assurance

1. Project management plan.

- **Quality management plan** : how quality assurance will be performed.
- **Process improvement plan**: steps for analyzing processes to identify activities which enhance their value.

2. Quality Metrics.

Inputs To Quality Assurance

3. Work Performance Information.

- Technical performance measures.
- Project deliverables status.
- Schedule progress.
- Costs incurred.

Inputs To Quality Assurance



4. Quality Control Measurements.

- To analyze the quality standards and processes of the performing organizations.

Tools and Techniques For Quality Assurance



1. Plan quality and Perform Quality Control Tools & Techniques.

2. Quality Audits.

- Identify all the good/best practices being implemented.
- Identify all the gaps/shortcomings.
- Share the good practices introduced or implemented.
- Proactively offer assistance in a positive manner.
- Highlight contributions of each audit in the lessons learned.

Tools and Techniques For Quality Assurance



3 Process analysis.

- Examines problems experienced, constraints.
experienced and non-value-added activities.
- Includes root cause analysis to develop the required preventive actions.

Outputs From Quality Assurance



1. Organizational Process Assets Updates.

2. Change requests.

- To increase effectiveness and/or efficiency of the policies, processes and procedures.

3. Project Management Plan Updates.

- Quality management plan.
- Schedule management plan.
- Cost management plan.

Outputs From Quality Assurance



4. Project Document Updates.

- Quality audits reports.
- Training plans.
- Process documentation.

3. Quality Control

Quality control: monitoring specific project results to ensure that they comply with the relevant quality standards while identifying ways to improve overall quality.

3. Quality Control

Although one of the main goals of QC is to improve quality, its main outcomes are:

- **Acceptance decisions:** are the products/services acceptable or should they be rejected and rework is then necessary.
- **Rework** : action taken to bring rejected items into compliance with products specs. Can be very expensive.
- **Process adjustments** : correct or prevent further quality problems based on quality control measurements (purchase faster server if response time is too slow).

3. Quality Control

- **The main outputs of quality control are:**
 - acceptance decisions.
 - Rework.
 - process adjustments.
- **Some tools and techniques include:**
 - Pareto analysis.
 - statistical sampling.
 - Six Sigma.
 - quality control charts.

Quality Control Flowchart



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Inputs

- .1 Project management plan
- .2 Quality metrics
- .3 Quality checklists
- .4 Work performance measurements
- .5 Approved change requests
- .6 Deliverables
- .7 Organizational process assets

Tools & Techniques

- .1 Cause and effect diagrams
- .2 Control charts
- .3 Flowcharting
- .4 Histogram
- .5 Pareto chart
- .6 Run chart
- .7 Scatter diagram
- .8 Statistical sampling
- .9 Inspection
- .10 Approved change requests review

Outputs

- .1 Quality control measurements
- .2 Validated changes
- .3 Validated deliverables
- .4 Organizational process assets updates
- .5 Change requests
- .6 Project management plan updates
- .7 Project document updates

Inputs To Quality Control



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- 1. Project Management Plan.**
- 2. Quality Metrics.**
- 3. Quality Checklists.**
- 4. Work performance measurements.**
 - **Planned vs. actual technical performance.**
 - **Planned vs. actual schedule performance.**
 - **Planned vs. actual cost performance.**

Inputs To Quality Control

5. Approved change requests.

6. Deliverables.

7. Organizational process assets.

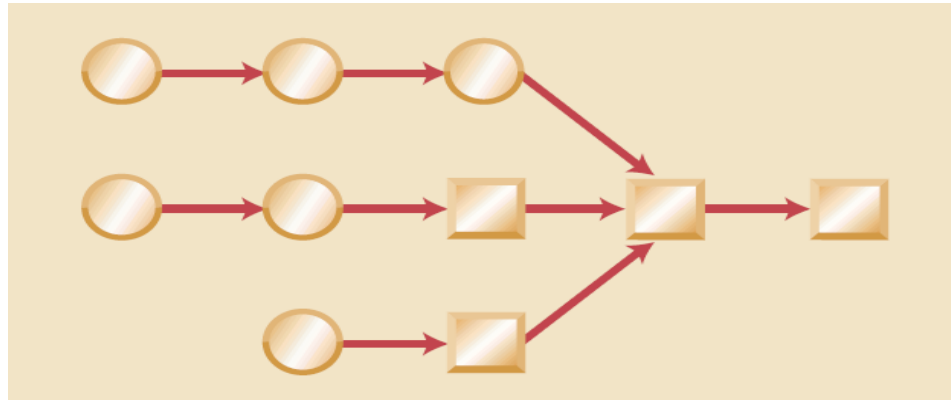
- **Quality standards & policies.**
- **Standards & work guidelines.**
- **Issue and defect reporting procedures and communication policies.**

Tools and Techniques for Quality Control

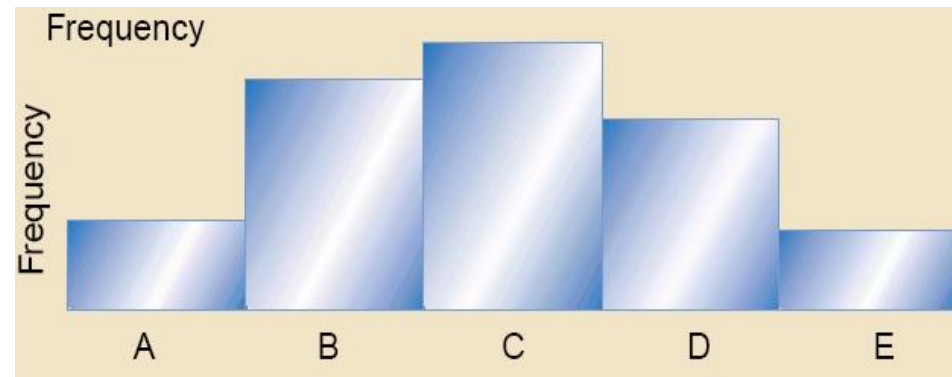
1. Cause & Effect Diagram.

2. Control Charts.

3. Flowcharting.



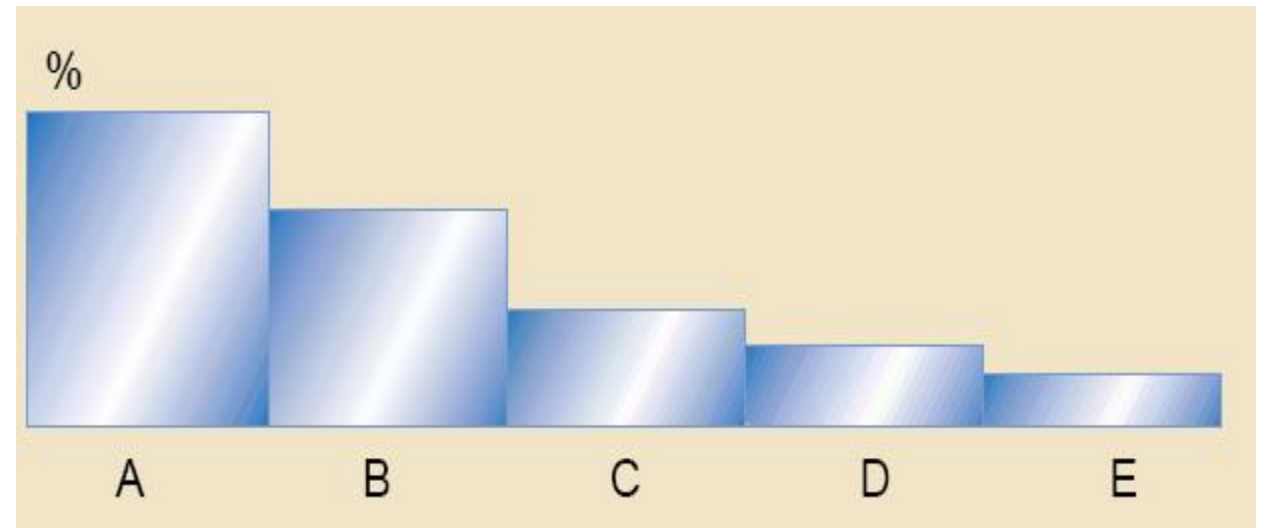
4. Histogram.



Tools and Techniques for Quality Control

5. Pareto Diagram.

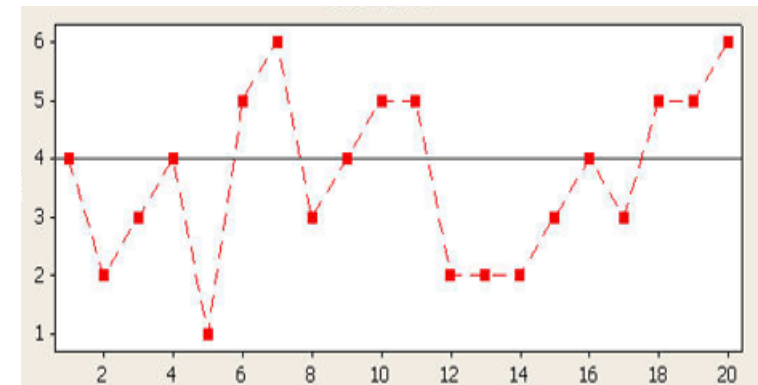
A Pareto diagram is a histogram ordered by frequency of occurrence which shows how many results were generated by what category or identified cause.



Tools and Techniques for Quality Control

6. Run Chart.

- Shows trends in a process over time, variation over time, or declines or improvements in a process over time.
- Trend analysis is often used to monitor:
 - Technical performance.
 - Cost & schedule performance.



Tools and Techniques for Quality Control

7. Scatter diagram



8. Statistical Sampling

Tools and Techniques for Quality Control

9. Inspection.

Examination of a work product to determine whether it confirms to documented standards.

- 10. Approved change requests review.



Outputs for Quality Control



1. Quality Control Measurements.

Documented results of quality control activities in the format specified during quality planning.

2. Validated changes. where the inspected items will either be accepted or rejected and those rejected may be reworked.

3. Validated deliverables.

Outputs for Quality Control

4. Organizational Process Assets Updates.

- Completed checklists.
- Lessons learned.

5. Change requests.

- A change request should be initiated in accordance with the defined perform integrated change control.

Outputs for Quality Control

6. Project Management Plan Updates.

- Quality management plan updates.
- Process improvement plan updates.

Outputs for Quality Control

7. Project document updates.

- **Completed Checklists**, which become a part of a project record when they are used.
- **Process Adjustments**, which involves immediate corrective or preventive action as a result of quality control measurements.

Thank You For your Attention!



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