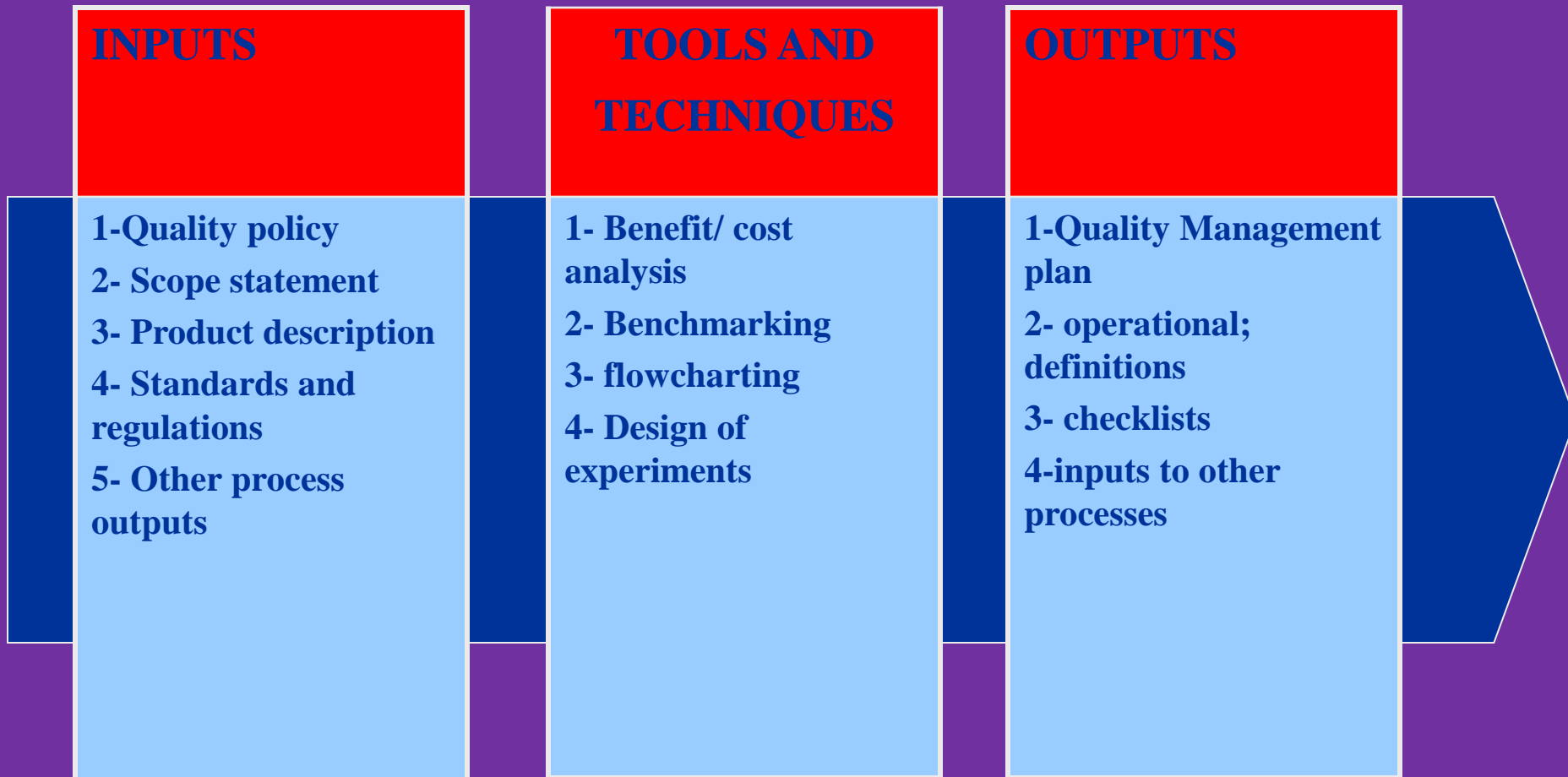


# QUALITY PLANNING

# Quality planning

- Quality Planning involves identifying with quality standards
- It is a key facilitating process during the Project planning Process
- In modern quality management quality is planned in and not inspected in
- Prior to the development of ISO 9000 series, quality planning concepts were widely discussed as part of quality assurance.

# Quality Planning Flowchart



# Quality Planning Inputs

## Quality policy

- the over all intentions and direction of an organization with regard to quality, as formally expressed by the top management
- In the case of a joint venture, a quality policy for the individual project should be developed
- The management team is responsible for dissipating the quality policy to all project stakeholders through appropriate information distribution channels

# Quality Planning Inputs

## Scope Statement

- The scope statement is a key input to quality planning because it documents major project deliverables as well as project objectives which serve to define important stakeholder requirements

# Quality Planning Inputs

## **Product description**

- Although the elements of the product description may be embodied in the scope statement, the product description often contains details of technical issues and other concerns that may affect quality planning

# Quality Planning Inputs

## **Standards and Regulations**

- The project management team any application-area-specific standards or regulations that may affect the project

# Quality Planning Inputs

## Other Process Outputs

- In addition to the scope statement and product description, processes in other knowledge areas may produce outputs that should be considered as part of the quality planning
- **Example:** procurement planning outputs may identify contractor quality requirements that should be reflected in the overall Quality Management Plan

# Tools and Techniques for Quality Planning

- **Benefit / cost analysis**

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

Note: it is elementary that the benefit should outweigh the cost

# Tools and Techniques for Quality Planning

## 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

Note: other projects compared may be within the same organization or out side and may be within the same application area or in another

# Tools and Techniques for Quality Planning

## Flow charting

- 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

## Design of Experiments

- This is an analytical technique which aims to define variables that have most influence on the overall outcome
- This technique is commonly applicable to the product of the project issues.
- However this technique can also be used in project management issues such as cost and schedule tradeoffs to allow for optima solutions.

# Outputs from Quality Planning

## Quality Management Plan

- The quality management plan should describe how a project management team will implement its quality policy
- Also called Quality System, (in ISO terminology), the plan should define :
  - The organizational structure
  - Roles and responsibilities
  - Resources needed for implementation of quality management

# Outputs from Quality Planning

## Quality Management Plan (continued)

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

Note: the project quality plan can be highly detailed or broadly framed based on the needs of the project

# Outputs from Quality Planning

## Operational Definitions

- An operational definition describes what something is and how it is measured by the quality control process. For example:
  - the project management team must indicate the start and end of every activity in a detailed schedule
  - Whether the whole activity or certain deliverables are to be measured

Operational definitions are also called *Metrics* in some areas of application

# Outputs from Quality Planning

## Checklists

- A checklist is a structured tool used to verify that a set of required steps or requirements have been performed.
- Many organizations have standard checklists to ensure consistency of frequently performed activities

# Outputs from Quality Planning

## Inputs To Other Processes

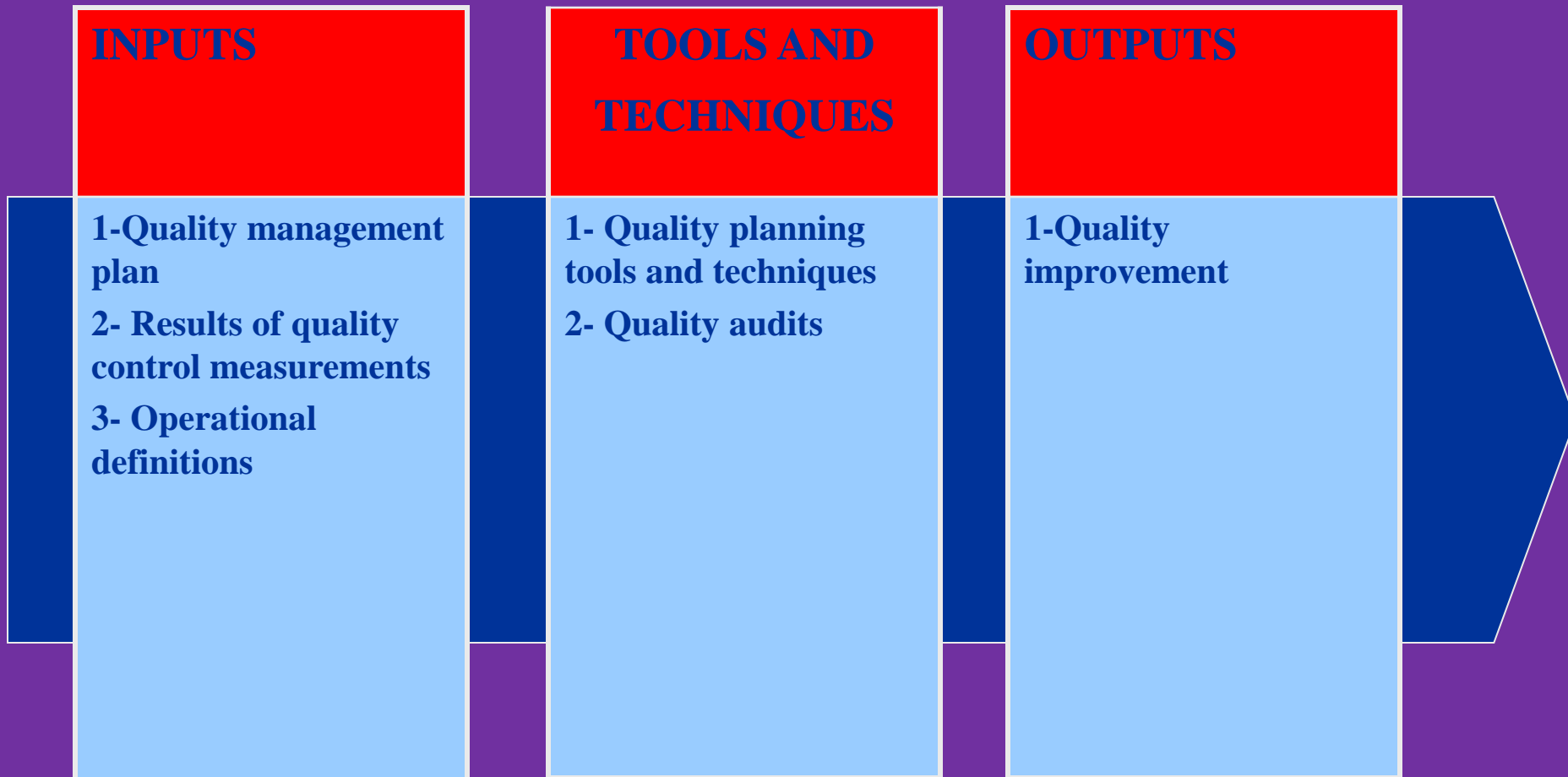
- The quality planning process may identify need for further activity in another area

# QUALITY ASSURANCE

# Quality Assurance

- Quality assurance encompasses all the planned and systematic activity implemented in a quality system to provide confidence that the project will satisfy the relevant quality standards
- Quality assurance is provided by a Quality Assurance dept.
- Quality assurance can be INTERNAL ( from the project management team to the performing organization)
- Quality assurance can be EXTERNAL (provided to the customer and other parties actively involved in the work of the project)

# Quality Assurance Flowchart



# Inputs To Quality Assurance

- Quality management plan as previously described
- Results of quality control measurements which are records of quality control testing and measurement in a format of comparison or analysis
- Operational definitions as previously described in the output of the Quality Planning

# Tools and Techniques For Quality Assurance

- Quality Planning tools and techniques , which can be used for quality assurance as well
- Quality Audits which are a structured review of other quality management activities:
  - they may be timely or carried out randomly
  - They may be carried out by properly trained Internal-auditors or by third parties such as quality systems registration agencies

# Outputs From Quality Assurance

## Quality Improvement

- Quality improvement includes taking action to increase the effectiveness and efficiency of the project to be provide added benefits to the stakeholders of that project .
- In many cases the implementation of quality improvements will require preparation of change requests or taking corrective actions and will be handled according to procedure for overall change control

# QUALITY CONTROL

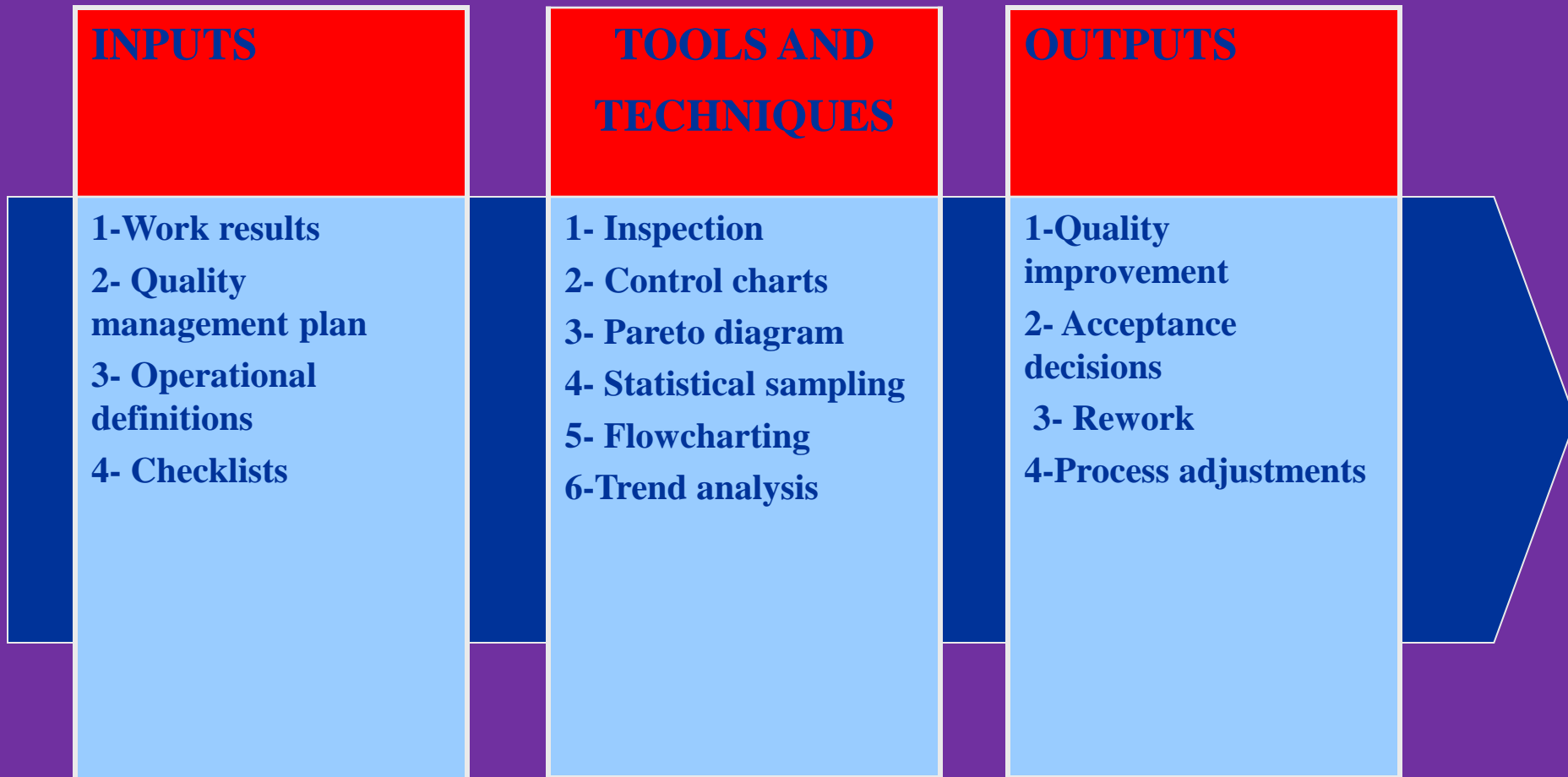
# Quality Control

- Quality control involves monitoring specific project results to determine if they comply with relevant standards and identifying ways to eliminate causes of unsatisfactory results.
- Project results mentioned include both PRODUCT results such as deliverables and MANAGEMENT results such as cost and schedule performance
- Quality control is often performed by a quality control department
- The project management team should have a working knowledge of statistical quality control especially sampling and probability to help evaluate and control outputs.

# Quality Control

- The project management should be aware of the following among other subjects:
  - *prevention* ( keeping errors out of the process)
  - *Inspection* (keeping errors out of the customers hand
  - *Attribute sampling* (for conformity of results)
  - *Variable sampling* (where the results are rated on a continuous scale that measures the degree of conformity or non conformity
  - *Special cause* ( unusual events)
  - *Random causes* ( normal process variations)
  - *Tolerances* ( where results should fall with in a defined tolerance range
  - *Control limits* ( the process is in control if it falls within these defined limits)

# Quality Control Flowchart



# Inputs To Quality Control

- **Work results** : including both product results and process results
- **The quality management plan**
- **Operational definitions**
- **Checklists**

# Tools and Techniques for Quality Control

## Inspection

- Inspection includes activities such as measuring, examining and testing undertaken to determine whether results conform to requirements
- Inspection can be carried out on the level of a single activity or a final product
- Inspections can be called reviews, product reviews, audits, and walk-throughs

# Tools and Techniques for Quality Control

- **Control Charts**

- These charts are graphical representations that display the result of a process over time and are used to determine if the process is “in control”
- When in control the process should ***not*** be adjusted , however it may be ***changed*** in order to provide improvements
- Control charts may be used to monitor any type of output variable
- Control charts are most often used to monitor repetitive activity in production but can also be used to monitor cost and schedule variances

# Tools and Techniques for Quality Control

## 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
- The project management team should take action to fix the problems that are causing the greatest number of defects first
- Typically the Pareto diagram reflects that a relatively small number of causes are responsible for the majority of the problems or defects.

# Tools and Techniques for Quality Control

## Statistical Sampling

- Statistical sampling involves choosing a part of a population of interest for inspection
- Appropriate sampling can effectively reduce the cost of quality control
- There is a vast body of knowledge related to statistical sampling and therefore the management must be aware of the various sampling techniques

# Tools and Techniques for Quality Control

## Flowcharting

- Flowcharting is used in quality control to help analyze how a problem occurs

# Tools and Techniques for Quality Control

## Trend Analysis

- The trend analysis involves the use of mathematical techniques to forecast future outcomes based on historical results it is often used to monitor:
  - **Technical performance** — *how many defects have been identified and how many remain uncorrected*
  - **Cost and schedule performance** — *how many activities in a certain period were completed with significant variances*

# Outputs for Quality Control

- **Quality improvement** ( previously described)
- **Acceptance decisions**, where the inspected items will either be accepted or rejected and those rejected may be reworked
- **Rework**, which is an action taken to bring defects or nonconforming items into compliance with requirements and specifications. Rework is a frequent cause of project over-runs and the project management team must make an effort to minimize it .

# Outputs for Quality Control

- **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. In some cases the adjustment may need to be handled according to procedures for overall change control.