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CONTENTS

- ❖ **Project and stages of project**
- ❖ **Management and Overview of Project Management**
- ❖ **Project Management Plan (PMP)**
- ❖ **Project Management Process Groups**
- ❖ **Project Management Knowledge Areas**
Integration, Scope, Time, Cost, Quality, Human Resource, Communications, Risk, Procurement, Document, Change
- ❖ **S-Curve**



Project :

Converting a vision, a dream or a need to reality.

- ✓ A job that has a beginning and an end (Time)
- ✓ A specified outcome (Scope)
- ✓ At a stated level of Performance (Quality)
- ✓ At a budget (Costs).



Project Characteristics :

- *Temporary* : Has definite Start and Finish
- *Unique* : Product/Service is different in some distinguishing way

VARIOUS STAGES OF PROJECT



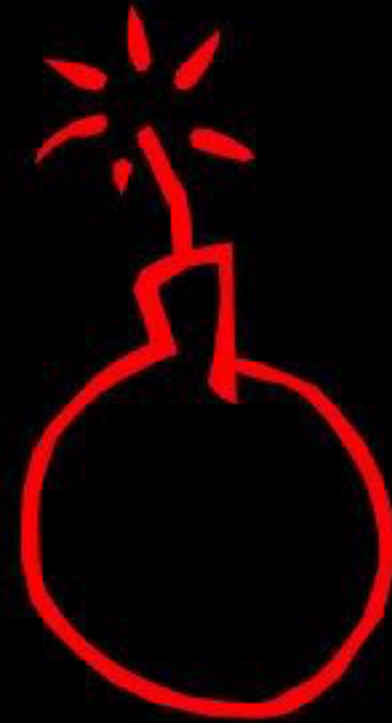
THINKING



PLANNING & SCHEDULING



DATA COLLECTION



STATUS UPDATING THROUGH
NETWORK AND
GIVING EARLY WARNINGS



PAVE A PATH
FOR
SUCCESSFUL COMPLETION





Management :

Management is the technique of understanding the problems, needs and controlling the use of Resources, Cost, Time, Scope and Quality.

Project Management :

Application of **knowledge, skills , tools & techniques** to project activities in order to meet **stakeholder** needs & expectations from a project.

Needs : stated part of the project

Expectations : unstated part of the project

“Completion of Project on time within Budget without compromising **Quality”**

Why do companies use PM?

- To handle projects effectively in an organization.
- To define the project and agree with the customer
- To plan and assess resource needs for the project
- To estimate project cost and make proposals
- To plan & schedule activities in a project.
- To allocate the right resource at the right time.
- To assess risk and failure points and make backup plans.
- To lead a project team effectively and communicate well.



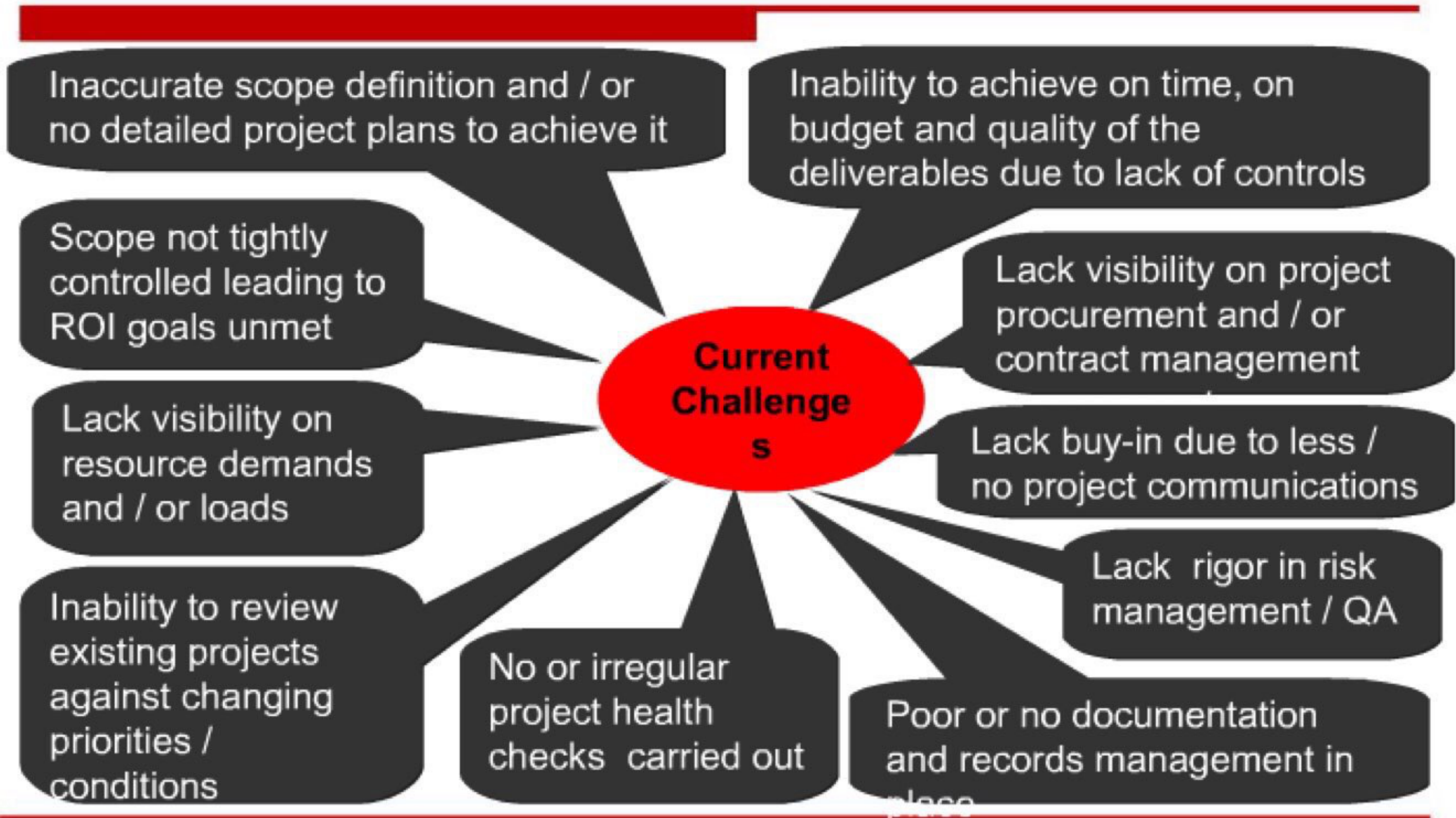
Why do people learn PM?

- ❁ To explore the latest concepts and techniques of project management.
- ❁ To increase value/contribution to the organization. To prove yourself skillful in managing projects.
- ❁ To learn a new thought process that helps organized thinking and structured approach.
- ❁ To acquire a professional degree/ recognition and increase job prospects.
- ❁ Endless possibilities and benefits.....



Project Management Overview

Project - Current Challenges

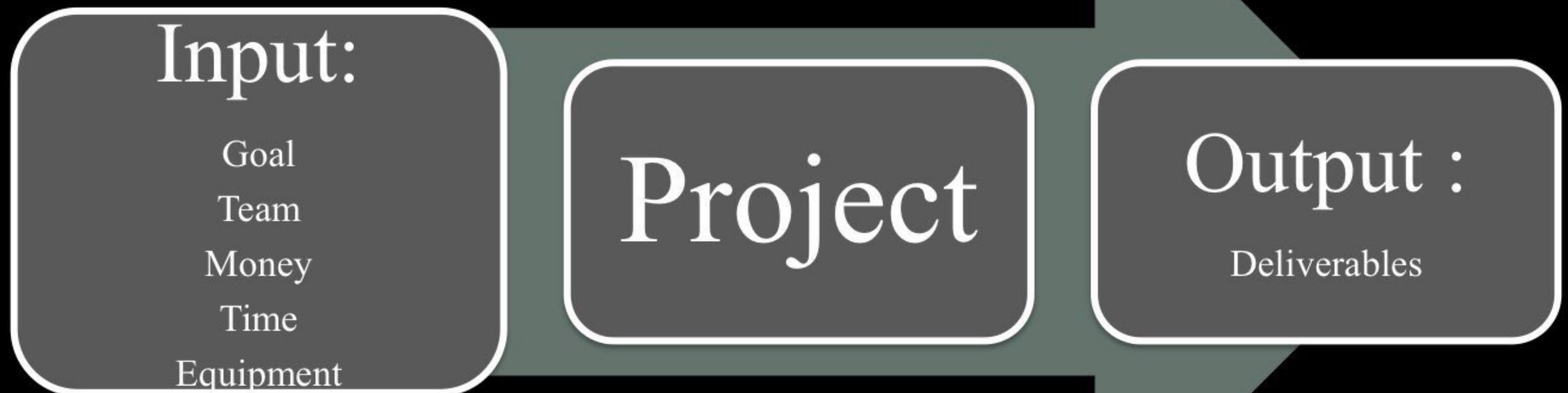




Project Management Plan :

“Tells How work will be done”

The key to a successful project is on the planning. All the detailed planning work for different aspects of the project is integrated into one single plan known as the Project Management Plan.



The PM Plan establishes the projects:

Why

- **‘Why’** is from the business case

Why & What

- **‘Why’ & ‘What’** are management statement of the success criteria and should be agreed with the project sponsor

Who

- **‘Who’** will do the work and stakeholder awareness of the project

When

- **‘When’** deals with schedules and phasing for the project

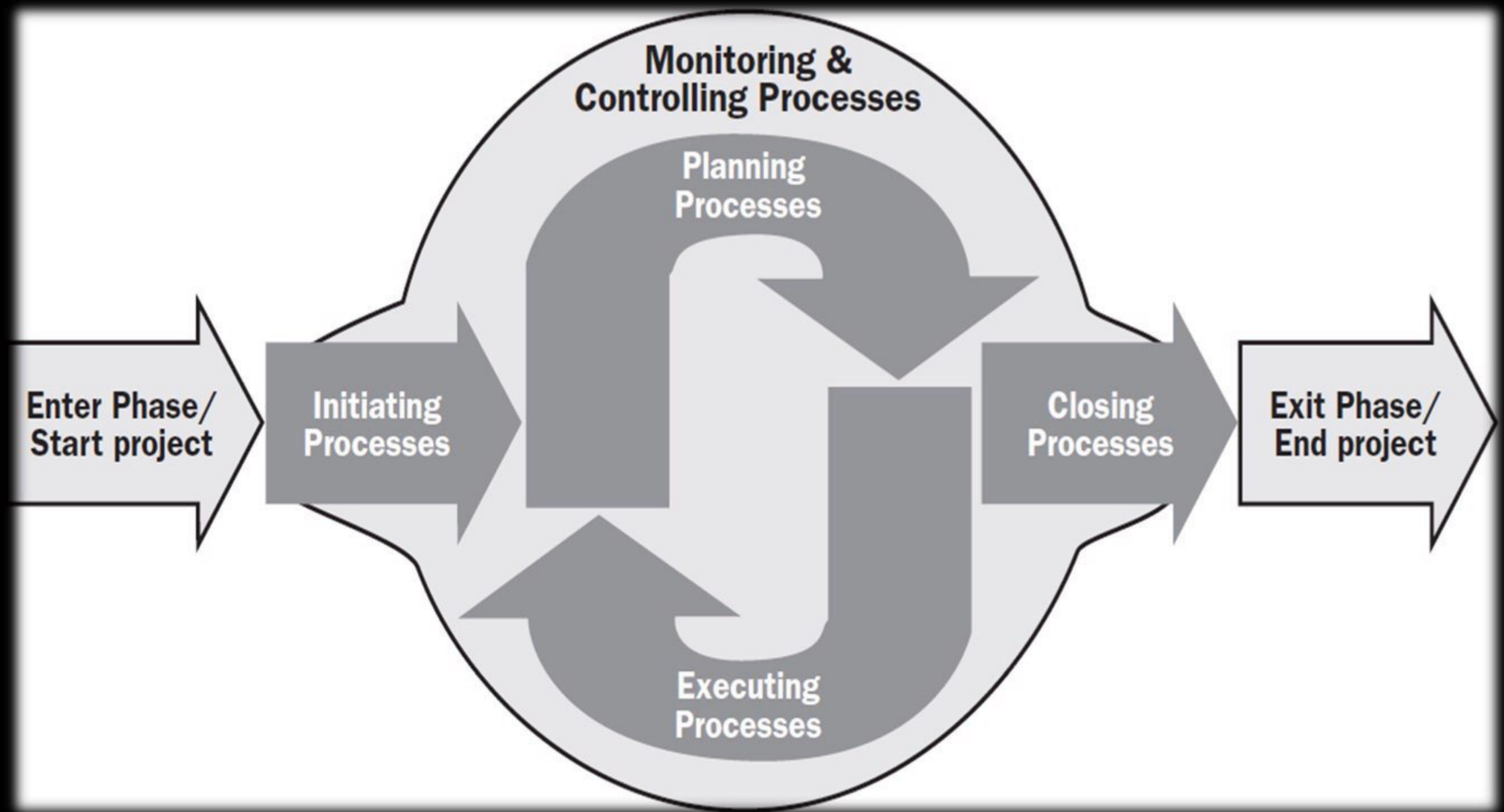
How

- **‘How’** which is the project manager vision to implement project from beginning to end

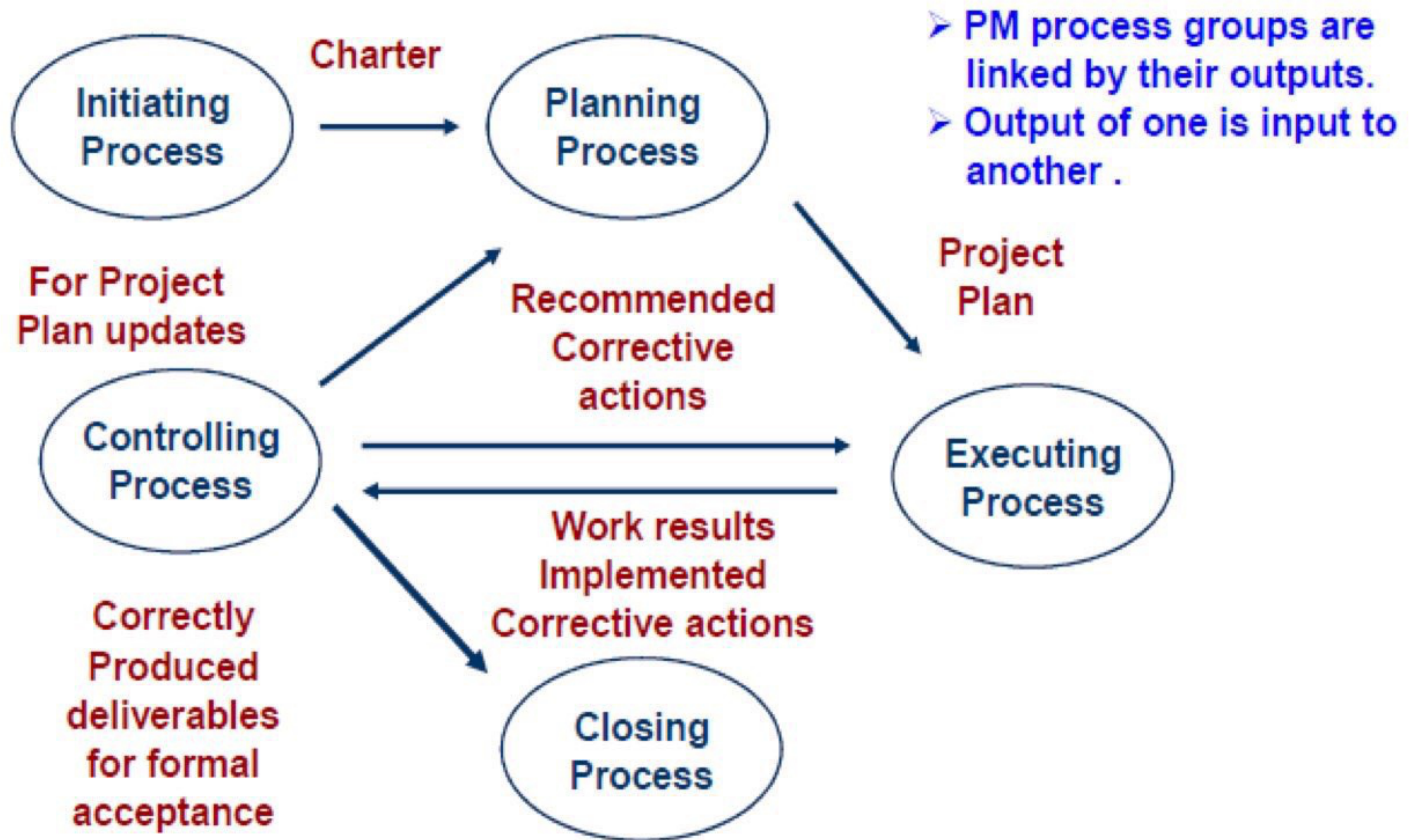
How much

- **‘How Much’** covers the costs and budgets of the project.

Project Management Process



Project Management Process Groups



PM Knowledge Areas



Project Integration Management

❖ **Project Integration Management** supports various elements of project management which are identified, defined, combined and coordinated.

- Develop Project Charter
- Develop Project Management Plan
- Direct and Manage Project execution
- Monitor and Control Project Work
- Perform Integrate Change Control
- Close Project or Close

Project Integration Management

Project Charter :

- ❑ DOCUMENT that formally authorizes a project.
- ❑ Provide information about internal and external parties involved in and affected by the project.
- ❑ Documenting initial requirements that satisfy the stake holders' needs and expectations.
- ❑ ISSUED by a project initiator or sponsor, external to project organization, at a level appropriate to project funding.
- ❑ EMPOWERS the project manager to apply resources to project.
- ❑ Summary level Milestone schedule and Summary level Budget.

Project Scope Management

❖ **Project scope management** includes the processes required to ensure that the project includes all the work required, and only the work required to complete the project successfully

- Collect requirements
- Define Scope
- Create WBS
- Verify Scope

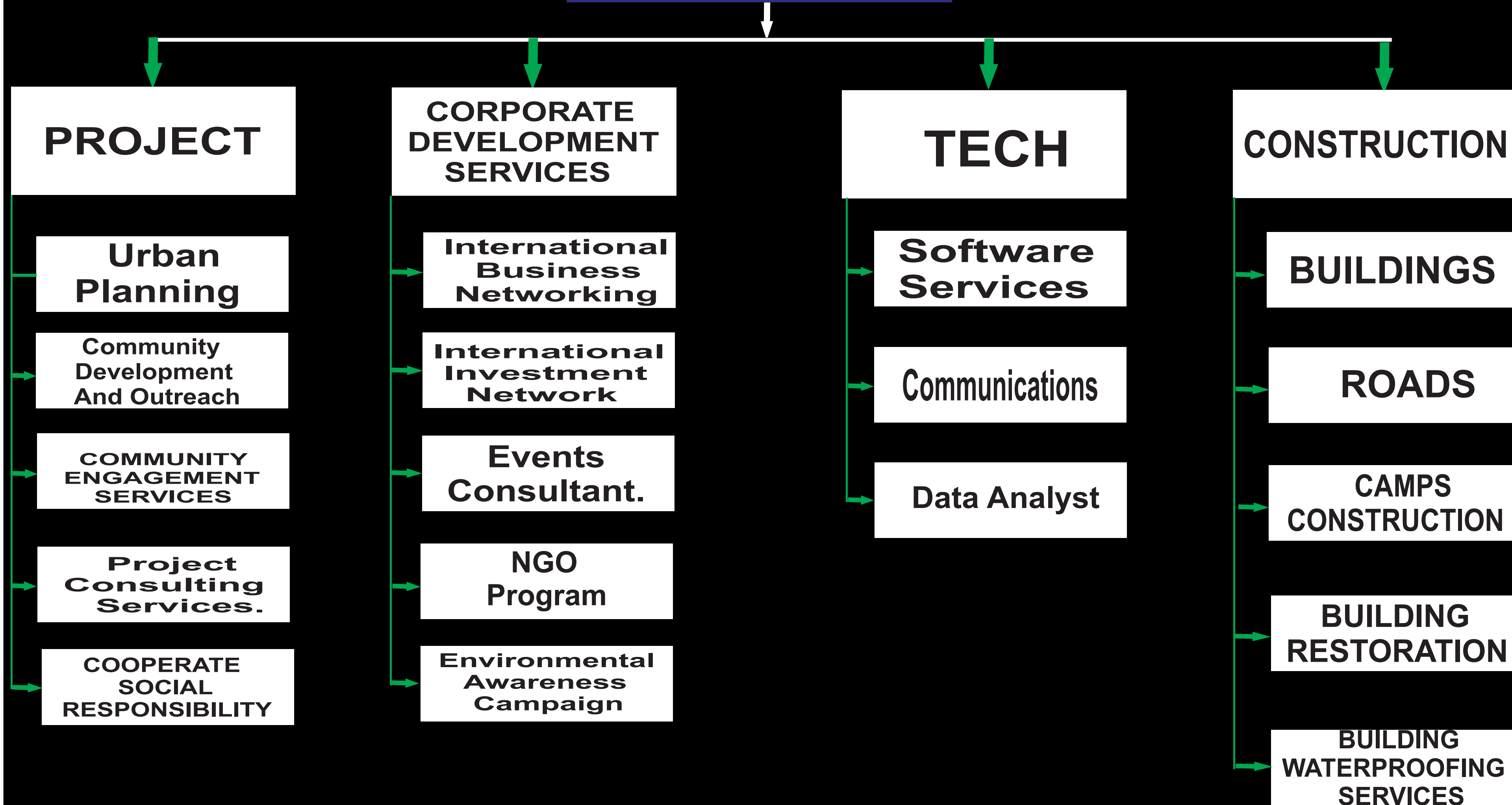
Project Scope Management

WBS – Work Breakdown Structure :

- ✓ A deliverable-oriented hierarchical decomposition of work to be executed by the project team to:
 - create required deliverables
 - accomplish project objectives
- ✓ WBS organizes and defines the total scope and represents specified in the current approved Scope Statement!
- ✓ Process of subdividing project deliverables and project work into more manageable components.
- ✓ Lowest level of WBS is work package can be scheduled, cost estimated, monitored, and controlled.

TYPICAL WBS OF A PROJECT

OUR CONSULTING SERVICES



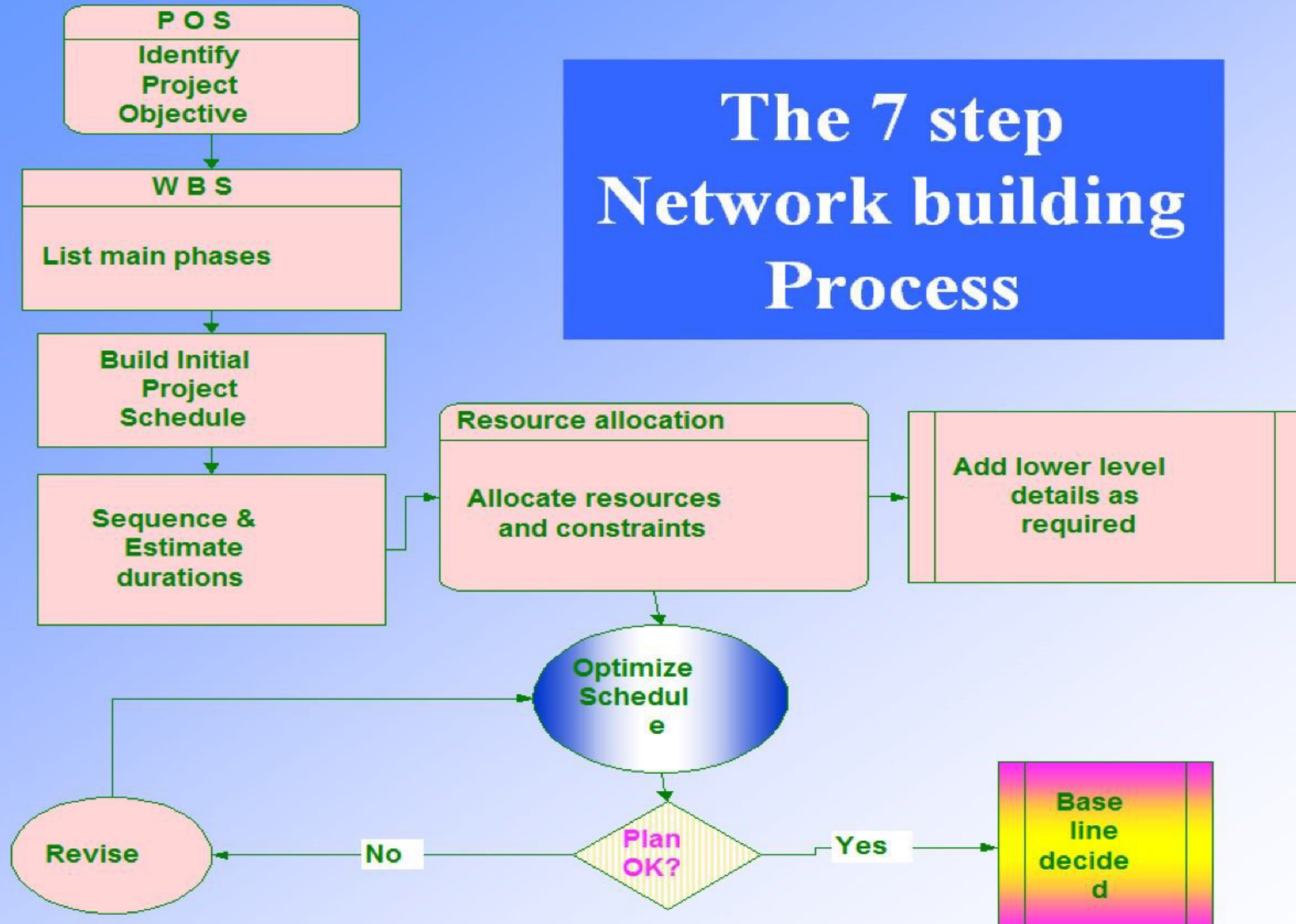
Project Time Management

❖ **Project Time Management** ensures the timely completion of the project.

- Plan Schedule Management
- Define Activities (Milestone List)
- Sequence Activities
- Estimate Activity Resources
- Estimate Activity Durations
- Develop Schedule
- Control Schedule

Project Time Management

The 7 step Network building Process



Project Time Management

- ✓ Schedule once finalized is set as a baseline
- ✓ Progress of work are tracked against the baseline
- ✓ Current progress is arrived from various (Engineering, Proc, Manufacturing and Construction) Trackers developed for the purpose. These schedules are called current schedules
- ✓ Analysis and forecasting is done in progress reports.

Schedule using MS Project

Schedule using Primavera (P6)

Engineering Tracker

Manufacturing & Supply Tracker

construction tracker

Project Cost Management

❖ **Project Cost Management** includes the processes involved in planning, estimating, budgeting and controlling costs so that the project can be completed **Within APPROVED BUDGET**.

- Estimate cost
- Convert it into budget
- Load the cost into schedule
- Perform earned value (EV) analysis
- Perform estimate at complete (EAC)
- Administer changes
- Control cost

Project Cost Management

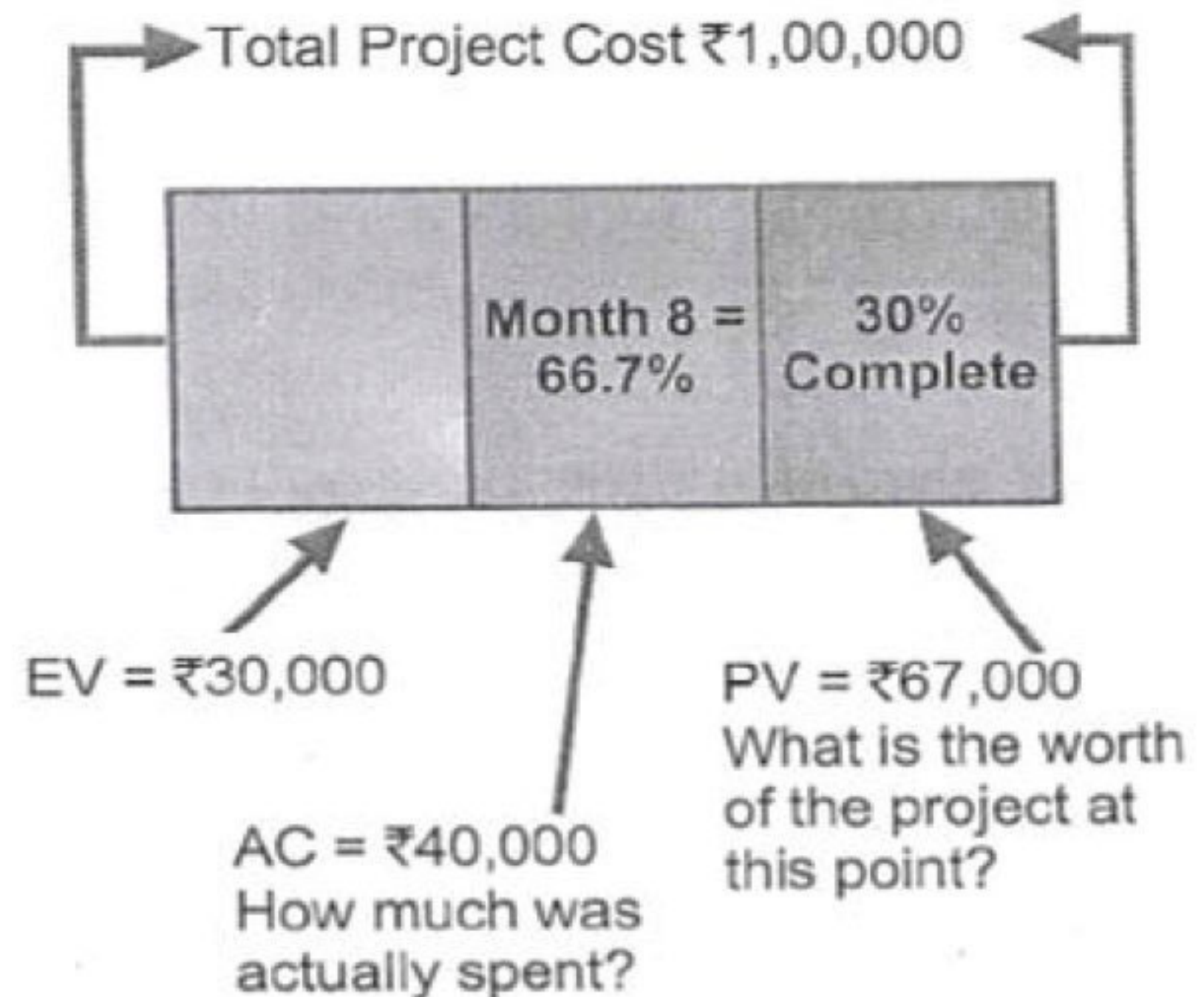
Earned Value Management

EVM develops and monitors three key dimensions:

- **Earned Value (EV):** EV is the value of work performed, expressed in terms of the approved budget assigned to that work. The term EV is often used to describe the percentage completion of a project.

- **Planned Value (PV):** PV is the authorized budget assigned to the work to be accomplished. The total of the PV is sometimes referred to as the Performance Measurement Baseline (PMB). The total planned value for the project is also known as Budget at Completion (BAC).

- **Actual Cost (AC):** AC is the total cost actually incurred and recorded in accomplishing the work performed.



Project Cost Management

Calculating Variance

Cost Variance

- Cost variance is the difference between the earned value and the actual cost.

$$CV = EV - AC$$

- For example, if the budget of a project is ₹2,00,000 and 20 per cent of the work has been completed in a month, then its EV becomes ₹40,000. But, due to unforeseen circumstances, the project manager had to spend ₹45,000 to complete that work. So,
 $CV = 40,000 - 45,000 = (-)5,000.$

Schedule Variance

- Schedule variance is the difference between the point at which the project was planned to be at a certain time and where the project actually is.

$$SV = EV - PV$$

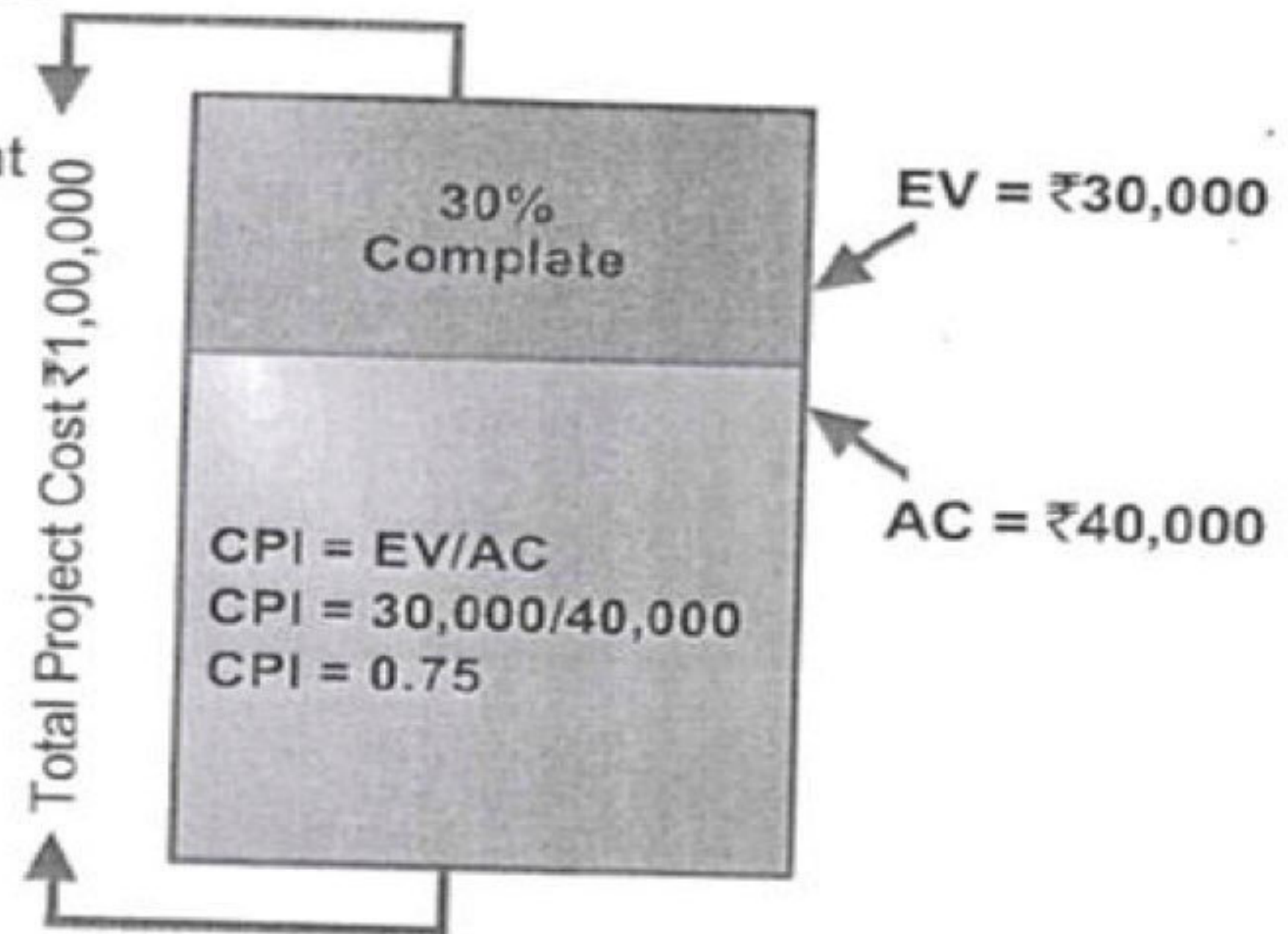
- For example, a project worth ₹2,00,000 is scheduled to last 1 year. At the end of six months, 50 per cent work should have been completed, as per the plan. Thus, $PV = ₹1,00,000$, but in reality only 40 per cent of the work has been completed, making the $EV = ₹80,000$. Difference between EV and PV = $(-)20,000$. Thus, $SV = -20,000$.

Project Cost Management

Performance Index: CPI and SPI

CPI (Cost Performance Index): EV/AC

- Shows the amount of work that the project is completing per rupee spent on it. The closer the number is to 1, the better the project is doing.
- If CPI is 0.75, it means that it is costing ₹1 for 75 per cent of the work done.
- CPI over 1 does not necessarily mean that the project is doing great. It may mean that estimates have been inflated or an expenditure is late or stuck in accounts payable.



SPI (Schedule Performance Index):

- SPI is similar to CPI. It indicates how closely the project is on schedule.
- Value of SPI less than 1.0 indicates that less work has been completed than was planned.

FORMULA: $SPI = EV/PV$

Project Cost Management

Estimate at Completion and Estimate to Complete

Estimate At Completion (EAC)

- EAC forecast for ETC work performed at the budgeted rate.

$$EAC = AC + BAC - EV$$

- EAC forecast for ETC work performed at the present CPI.

$$EAC = \frac{BAC}{\text{Cumulative CPI}}$$

- EAC forecast for ETC work considering both SPI and CPI factors.

$$\frac{AC + (BAC - EV)}{(\text{Cumulative CPI} \times \text{Cumulative SPI})}$$

Estimate To Complete (ETC)

- ETC indicates how much more money will be required to complete the project work.

$$ETC = EAC - AC$$

- The To-Complete Performance Index (TCPI) is the calculated projection of the cost performance that must be achieved on the remaining work to meet a specified management goal such as the BAC or the EAC.

Equation for the TCPI based on the BAC:

$$\frac{(BAC - EV)}{(BAC - AC)}$$

TCPI based on the EAC: $\frac{(BAC - EV)}{(EAC - AC)}$

Project Quality Management

❖ **Project Quality Management** ensures the project will satisfy NEEDS for which it was undertaken.

- Plan Quality
- Perform Quality Assurance
- Perform Quality control

Quality is delivering to satisfy Customer.

A quality oriented project has two aims :

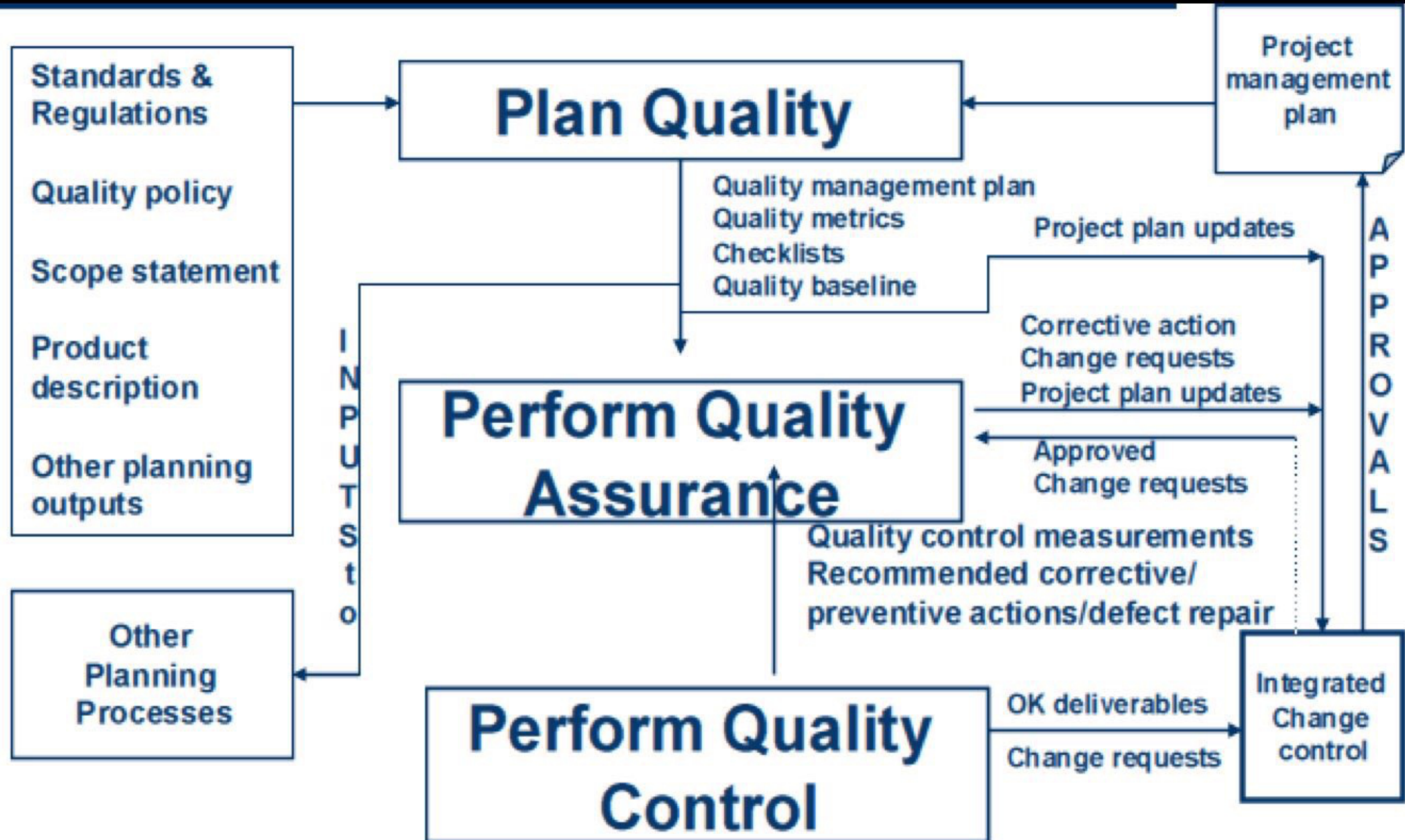
1. To produce the correct end item
2. To produce it in the correct way

Project Quality Management

THE CONCEPT

- ❖ PROJECT QUALITY MANAGEMENT IS COMPATIBLE WITH:
- ✓ ISO 9000 and 10000 series
- ✓ Proprietary quality management approaches (Deming, Juran, Crosby, and others)
- ✓ Nonproprietary approaches (TQM, Six Sigma, FMEA, Design Reviews, Voice of Customer, COQ, and Kaizen (continuous improvement))
- ❖ Hence, Modern quality management complements Project Quality Management. Both advocate the same tenets:
 - Customer satisfaction
 - Prevention over inspection
 - Management responsibility
 - Continuous improvement

Project Quality Management



Project Quality Management

Plan Quality Techniques

- Cost benefit analysis
- Benchmarking
- Design of experiments
- Cost of Quality
- Seven quality tools
- Statistical sampling
- Additional planning tools
- Quality Management Methodologies (Six Sigma, CMMI)

Perform Quality Assurance Techniques

- Quality management and control tools
- Quality audits
- Process analysis

Perform Quality Control Techniques

- Statistical sampling
- Inspection
- Seven quality tools and techniques
 - √ Cause and effect diagram
 - √ Flowcharts
 - √ Check sheets
 - √ Pareto diagrams
 - √ Histogram
 - √ Control charts
 - √ Scatter diagram

Project Human Resource Management

❖ **Project Human Resource management** includes the processes that organize, manage, and lead the project team and to make most effective use of people involved in the project.

- Develop Human Resource Plan
(Role & Responsibility, Organization chart, Staffing Management Plan)
- Acquire project team
- Develop project team
- Manage project team

Organization Chart

Project Human Resource Management

Project HR Management



Project Communications Management

❖ **Project Communication management** include processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information.

- Identify Stakeholders
- Plan Communication
- Distribute Information
- Manage Stakeholders expectations
- Report Performance

Project Communications Management

Communication requirements analysis

Whom do we need to send Project Information?

- Customer
- Sponsor
- Senior management
- Functional managers
- Team members
- Other project managers
- Regulatory authorities
- Media
- Society
- Outside specific interest groups, organizations
- Any other stakeholder stakeholders

Project Communications Management

Communication requirements analysis



What do we need to communicate on our project?

- 1) Status
- 2) Performance baselines
- 3) Achievements (major milestones, intermediate milestones, etc.)
- 4) Problems
- 5) Changes to scope, schedule, cost, etc.
- 6) Adherence to standards and regulations
- 7) New risks uncovered
- 8) Team members performance
- 9) Project phase deliverable's acceptance, project's product acceptance, etc.

Project Communications Management

Project Communications Management

Develop project charter

- Project charter
- Procurement documents

Stakeholder Management Strategy

Plan procurements

Enterprise/organization

- Enterprise environmental factors
- OPAs

Identify stakeholders

Stakeholder Register

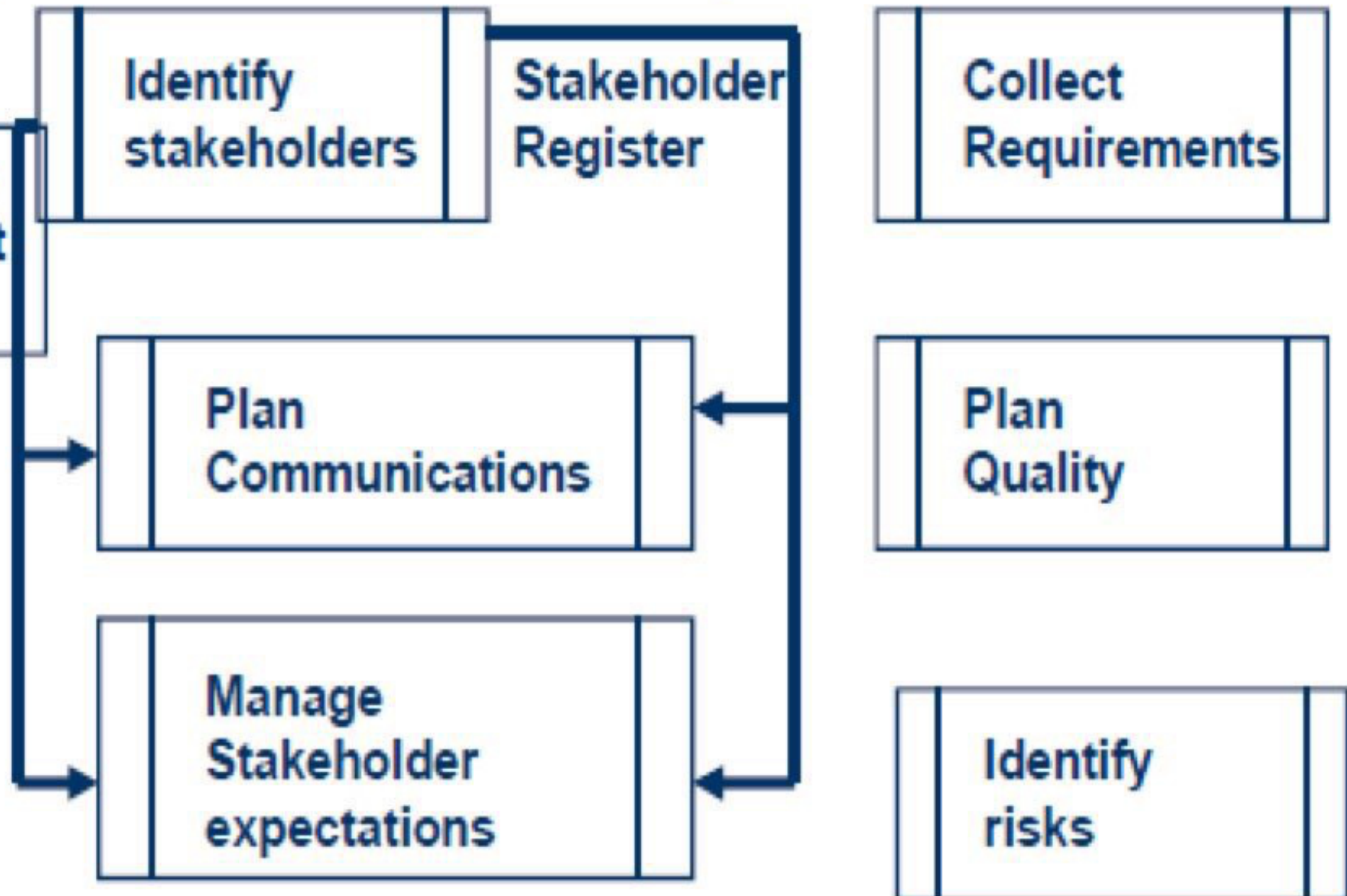
Collect Requirements

Plan Communications

Plan Quality

Manage Stakeholder expectations

Identify risks



Project Risk Management

❖ **Project Risk Management** is concerned with identifying, analyzing and responding to project risks.

- Plan Risk Management
- Identify Risks
- Perform Qualitative Risk Analysis
- Perform Quantitative Risk Analysis
- Plan Risk responses
- Monitor and Control Risks

Risk Register

Risk
Assessment

Risk
Control

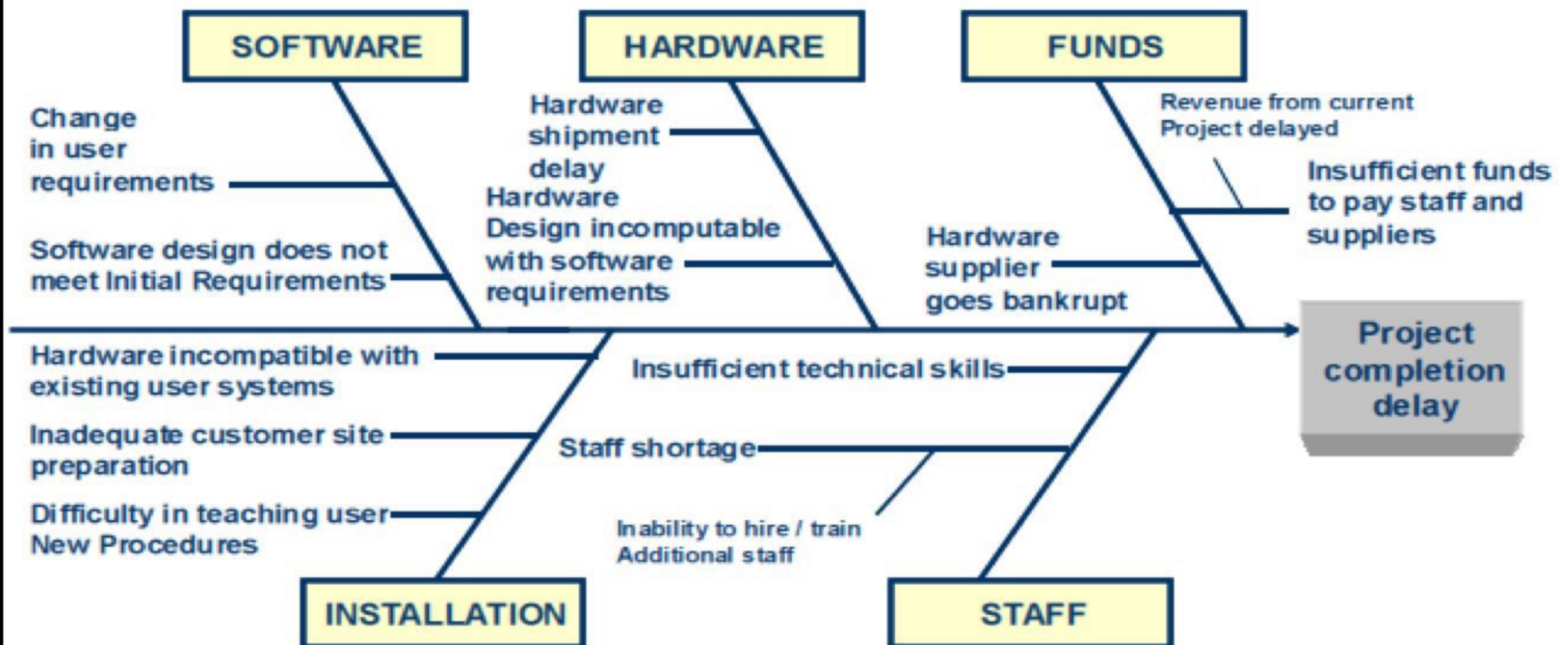
Risk
Ranking

Risk
Mitigation

❖ Risk identification tools and techniques :

1. Documentation Reviews
2. Information gathering reviews
3. Checklist analysis
4. Assumption analysis
5. Diagramming techniques

➤ Cause-and-effect diagrams (Ishikawa / fishbone diagrams)



Project Procurement Management

❖ **Project Procurement Management** is needed to acquire material, goods and services outside performing organization to meet project scope.

- ❑ Plan Procurements- make or buy decision, prepare procurement documents
- ❑ Conduct Procurement – obtain proposals, select sellers, award contract
- ❑ Administer Contracts – check performance and manage changes
- ❑ Close Procurement – completing each procurement

Project Procurement Management

Plan Procurements: PROCESS OVERVIEW

INPUTS

- Enterprise environmental factors
- Organizational process assets
- Scope baseline
- Requirements documentation
- Teaming agreements
- Risk register
- Risk-related contract decisions
- Activity Resource requirements
- Project schedule
- Activity cost estimates
- Cost baseline

TOOLS & TECHNIQUES

- Make-or-buy Analysis
- Expert Judgment
- Contract Types (Selection)

OUTPUTS

- Procurement Management Plan
- Procurement Statements of work
- Make-or-buy decisions
- Procurement documents
- Source selection criteria (evaluation criteria)
- Change requests

Project Procurement Management

Conduct procurements *process overview*

INPUTS

- OPAs
- Project management plan
- Procurement documents
- Source selection criteria
- Qualified seller list
- Seller proposals
- Project documents
- Make-or-buy decisions
- Teaming agreements

TOOLS & TECHNIQUES

- Bidder Conferences
- Advertising
- Proposal evaluation techniques
- Independent estimates
- Expert judgment
- Internet search
- Procurement negotiations

OUTPUTS

- Selected sellers
- Procurement contract award
- Resource calendars
- Change requests
- Procurement management plan updates
- Project document updates

Project Change Management

- ❖ Projects generally don't go 100% as planned resulting into variations from plans in scope, time, cost, quality
- ❖ **For change Management**, Change control boards (CCBs) can use expertise from various sources like consultants, Industry groups, Professional and technical associations, Subject matter experts, stakeholders etc.

Project Document Management

Document management is very important aspect of project management.

- ✓ This can be a sophisticated software or simple excel sheets depending on the organization strategy
- ✓ Once adopted its use should be fully exploited viz. 100% documents should pass through it and document reviews should be done as per the matrix defined
- ✓ MIS of document status be generated at the end of period

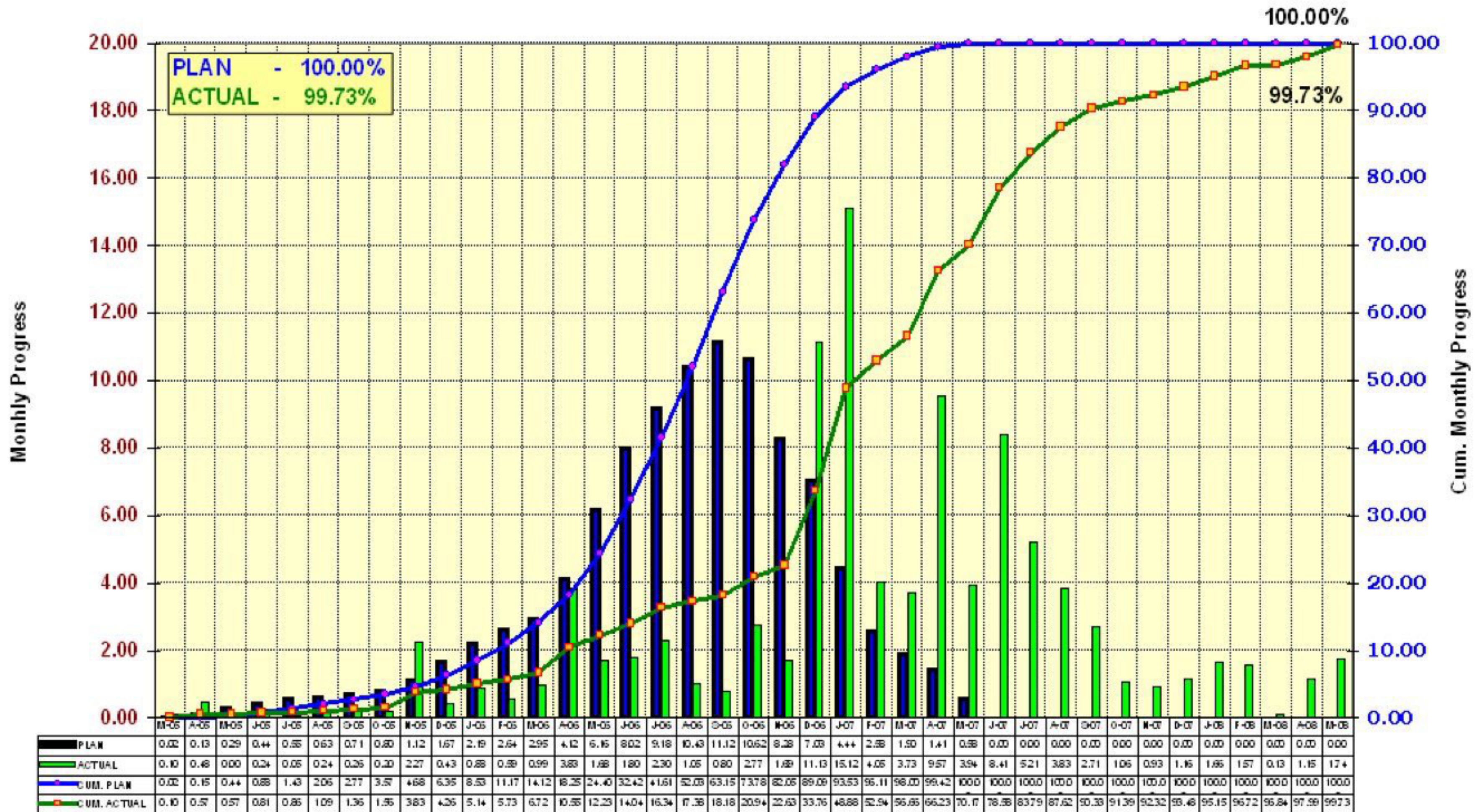
Project Document Management

- ✓ Proper DMS ensures right information to all stakeholders at all times
- ✓ Avoid using obsolete drawings and designs for execution
- ✓ Serves a very good engine for future use of project data
- ✓ Example of a simple document management system

Document control log

S-Curve in Monthly Progress Report

Progress reporting is done through different formats and curves.



What is "S Curve"

S- Curve is the graphic display of cumulative progress plotted against time.

Ideal S - Curve is a sinusoidal curve based on the following formulae:

$$Y = [1 - \sin(x/x_n * 180 + 90)] * 50$$

Y – Percent progress

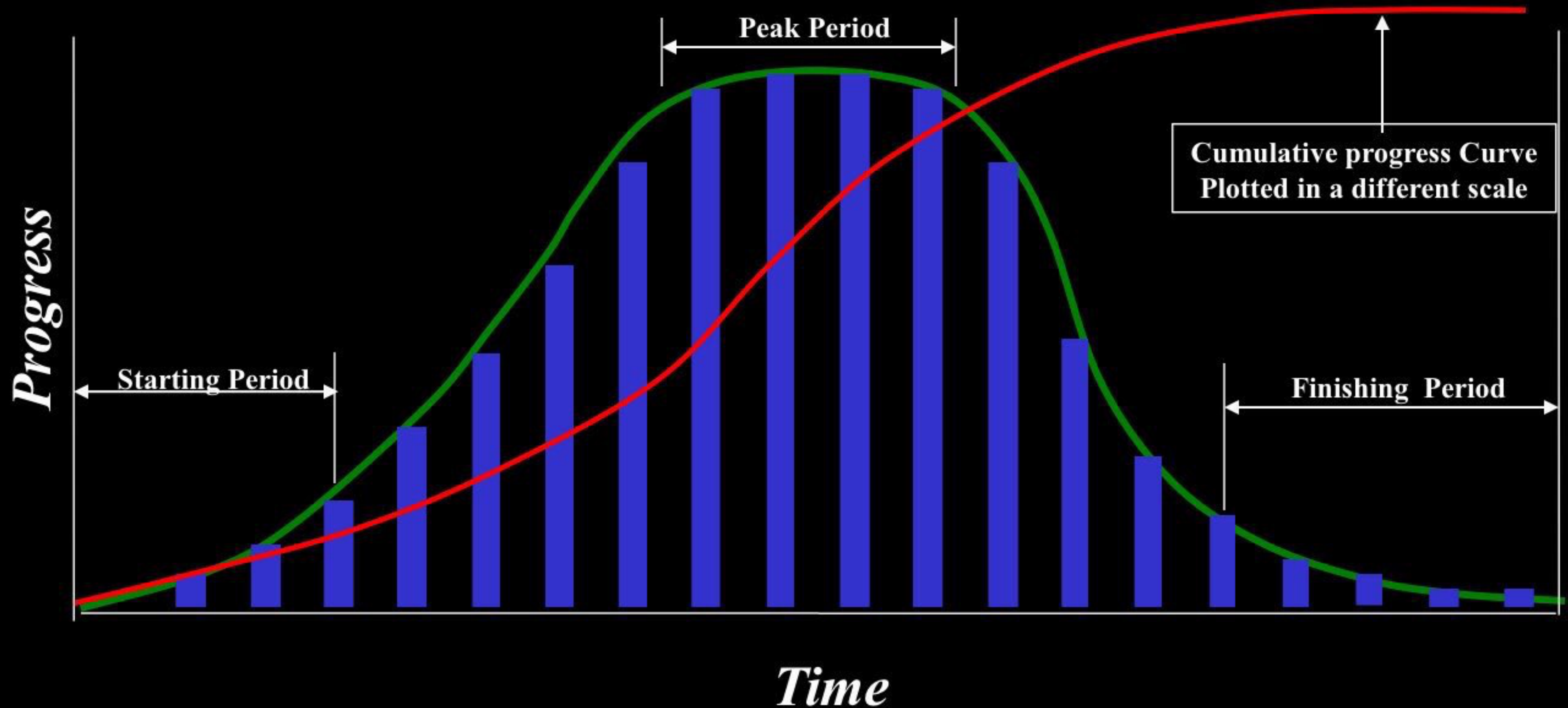
x – Period at which s-curve value required

x_n – Total period

The name is derived from the 'S' like nature of the curve.

S-Curve

Progress distribution curve



It is an ideal distribution curve. Depending upon the various guiding factors it may vary.

"S Curve" or Project Life Cycle

