

SOFTWARE PROJECT MANAGEMENT

UNIT-I

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SYLLABUS – UNIT 1

▶ **Project Management**

- ▶ Introduction to Project and Project management- problems with software projects

▶ **Stages of project**

▶ **Feasibility study : Cost-benefit analysis**

▶ **Planning - project execution - project and product lifecycle**

▶ **Project Stakeholders**

- ▶ All Parties of project - Role of project manager

▶ **Checkpoints And Processes of Project**

- ▶ Major Milestones- Minor Milestones- Periodic status assessments.

▶ **Processes**

- ▶ Initiating Processes- Planning Processes- Control Processes- Executing Processes- Closing

UNIT - 1



1.1 DEFINITION OF PROJECT

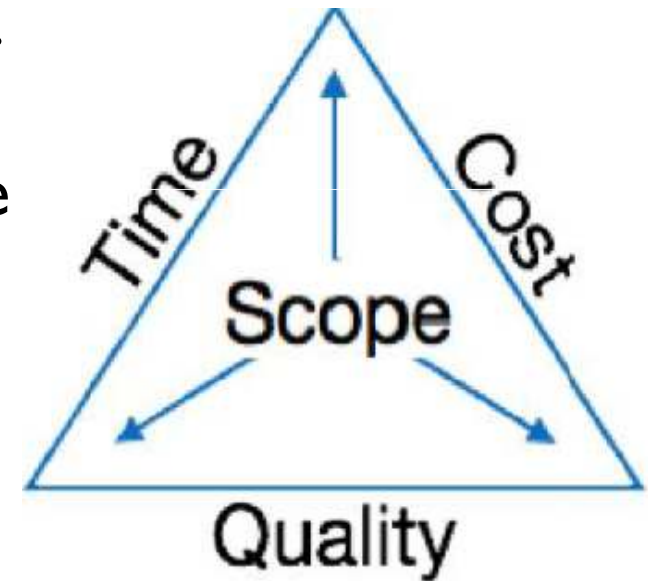
- ▶ Project is a temporary endeavor undertaken to create a unique product or service or result.
- ▶ Project is a unique process, consist of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective confirming to specific requirements, including the constraints time, cost, resource.
- ▶ Examples of project:
 - ▶ Software for Payroll
 - ▶ College Administration System
 - ▶ Construction of farm building
- ▶ It may be noted that each of these projects differ in composition, type, scope, size and time.

1.2 Project Characteristics

- ▶ Projects share the following common characteristics.
 - ▶ Unique in nature.
 - ▶ Have definite objectives (goals) to achieve.
 - ▶ Requires set of resources.
 - ▶ Have a specific time frame for completion with a definite start and finish.
 - ▶ Involves risk and uncertainty.

1.3 Project Performance Dimensions

- ▶ Time, Cost, Scope, Quality are dependent.
- ▶ If the **scope is enlarged**, project would require more time for completion and the cost would also go up.
- ▶ If **time is reduced** the scope and cost would also be required to be reduced.
- ▶ **Change in cost** would be reflected in scope and time.
- ▶ Performance of a project is measured by the degree to which these three parameters (scope, time and cost) are achieved.
- ▶ Mathematical Performance = $f(\text{Scope, Cost, Time})$



1.4 Problems with Software Projects

- ▶ Chief reasons for software project failures:
 - ▶ Insufficient planning
 - ▶ Changes in the context (funding, priorities)
 - ▶ Doing something without a clear customer base
 - ▶ Competition
 - ▶ Entrepreneurial nature of software
 - ▶ Lack of a reasonable & structured software/feature plan
 - ▶ Cost overruns
 - ▶ Misunderstanding of requirements
 - ▶ Poor understanding of goals
 - ▶ Over-ambitious goals
 - ▶ Lack of clear specification
 - ▶ Poor planning/research
 - ▶ No commercial market for end product
 - ▶ Complexity of software

1.5 PROJECT MANAGEMENT KNOWLEDGE AREA AND FRAMEWORK

- ▶ **Project management** – Knowledge, skills, tools and techniques to accomplish project work.
- ▶ **Triple Constraint** –Cost, Time and Scope:As well as Quality, Risk and Customer Satisfaction.
- ▶ **Management by Projects**
 - Project Integration Management , Project Scope Management , Project Time Management, Project Cost Management , Project Quality Management, Project Human Resource Management
- ▶ **Areas of Expertise Required for Project Management.**
 - ▶ Application areas of project include knowledge, standards and regulations.
 - ▶ Functional Departments and supporting disciplines
 - ▶ Technical elements
 - ▶ Management specializations
 - ▶ Industry groups

1.6 STAGES OF PROJECT

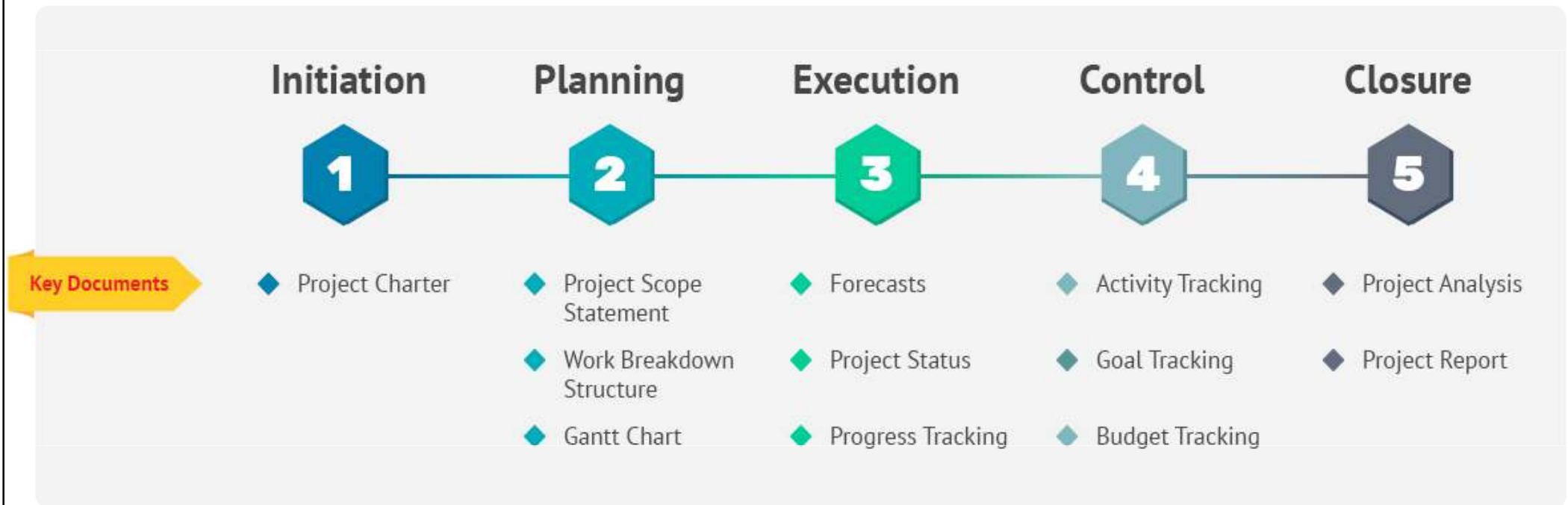


Image Courtesy : <https://www.business2community.com/strategy/what-is-the-project-life-cycle-and-how-to-use-it-better-02080105>

STAGES OF PROJECT

The number of phases in a project varies according to the project's type and the manager's techniques, and may range from four to six steps.

1. Initiation and Planning

- ▶ it is a formalization of the project's core idea.

2. Execution

- ▶ The execution phase is the real start of the project's implementation.

3. Project Monitoring and Control

- ▶ project monitoring and control involves managers making sure that task deadlines are met and costs are within the allocated budgets.

4. Project Closing

- ▶ Project Closing involves two elements :
 - ▶ **Making a report** that details how the project ran over the previous three phases.
 - ▶ **Project review**, which is the project team meeting where team members can put in their own input regarding the project's implementation.

1.6.1 Feasibility Study

- ▶ Feasibility study is **focused towards goal of the organization.**
- ▶ Study analyzes whether the software be **practically materialized** in terms of implementation, contribution of project to organization, cost constraints.
- ▶ It **explores technical aspects** of the project and product such as usability, maintainability, and productivity and integration ability.
- ▶ **Output of this phase is feasibility study report.**

Feasibility Study

- ▶ **The project feasibility studies focus on**
 - ▶ Economic and Market Analysis
 - ▶ Technical Analysis
 - ▶ Market Analysis
 - ▶ Financial Analysis
 - ▶ Economic Benefits
 - ▶ Project Risk and Uncertainty
 - ▶ Management Aspects

1.6.2 Project Planning

- ▶ Project structure is planned based on project appraisal and approvals.
- ▶ Detailed plans for activity, finance, and resources are developed and integrated to the quality parameters.
- ▶ Major tasks need to be performed in this phase are
 - ▶ Identification of activities and their sequencing
 - ▶ Time frame for execution
 - ▶ Estimation and budgeting
 - ▶ Staffing
- ▶ Output of this phase is **Detailed Project Report (DPR)**.

1.6.3 Execution Phase

- ▶ This phase of the project witnesses the concentrated activity where the plans are put into operation.
- ▶ Each activity is monitored, controlled and coordinated to achieve project objectives.
- ▶ Important activities in this phase are
 - ▶ Communicating with stakeholders
 - ▶ Reviewing progress
 - ▶ Monitoring cost and time
 - ▶ Controlling quality
 - ▶ Managing changes

1.7 Project & product life cycle

▶ **Project Life cycle**

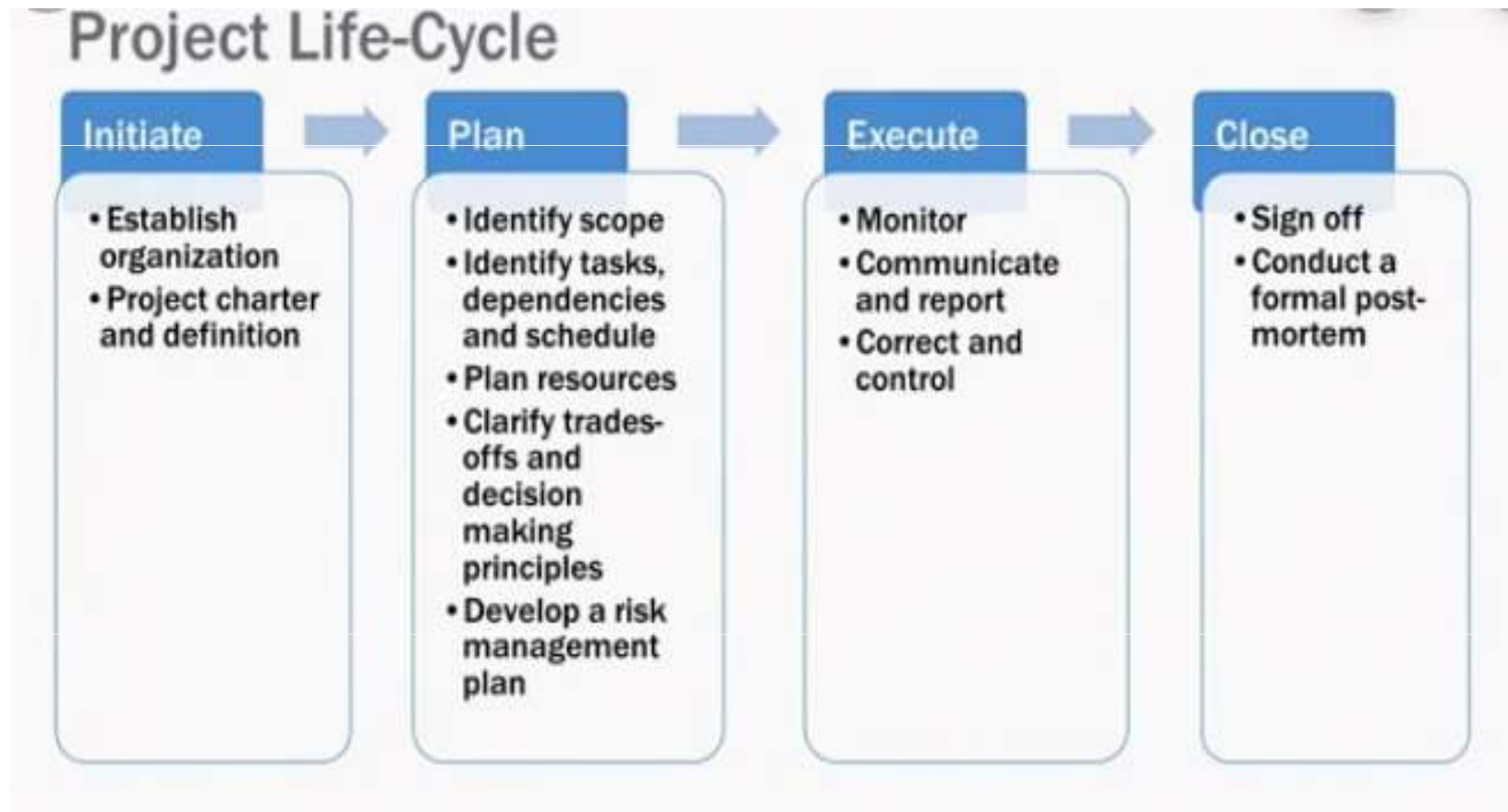
Project Life Cycle is the entire cycle that enraptures a project.

▶ There are typically five different processes that take place in a project:

1. Initiation
2. Planning
3. Executing
4. Monitoring and Control
5. Closing



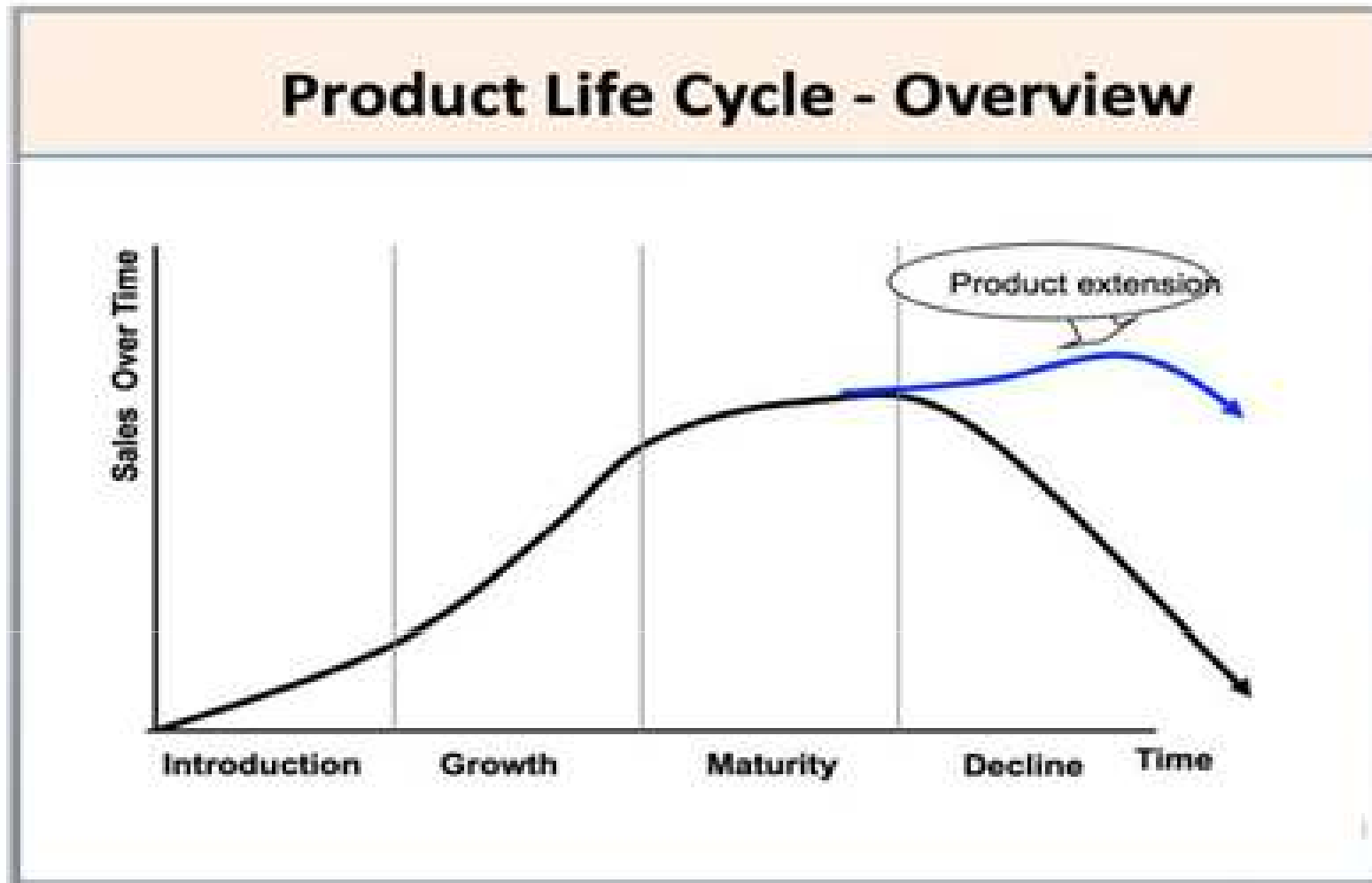
Project Life cycle



Product-Life-Cycle

- ▶ Product Life Cycle defines the different stages that enrapture the growth of a product.
- ▶ A product typically goes through the following stages.
 - ▶ Market Introduction
 - ▶ Market Growth
 - ▶ Market Maturity
 - ▶ Decline and Saturation Stage

Product Life Cycle - Overview



Product Life Cycle

- ▶ **Introduction** –researching, developing and then launching the product
- ▶ **Growth** –when sales are increasing at their fastest rate
- ▶ **Maturity** –sales are near their highest, but the rate of growth is slowing down, e.g. new competitors in market or saturation
- ▶ **Decline** –final stage of the cycle, when sales begin to fall

1.8 Management by Projects

Project management approach defines its activities as projects in a way that is consistent with definition of project.

- ▶ **Project Integration Management**

- ▶ various elements of the project are properly coordinated.

- ▶ **Project Scope Management**

- ▶ includes all the work required, to complete the project successfully.

- ▶ **Project Time Management**

- ▶ ensure timely completion of the project.

- ▶ **Project Cost Management**

- ▶ completed within the approved budget.

- ▶ **Project Quality Management**

- ▶ project will satisfy the needs for which it was undertaken

- ▶ **Project Human Resource Management**

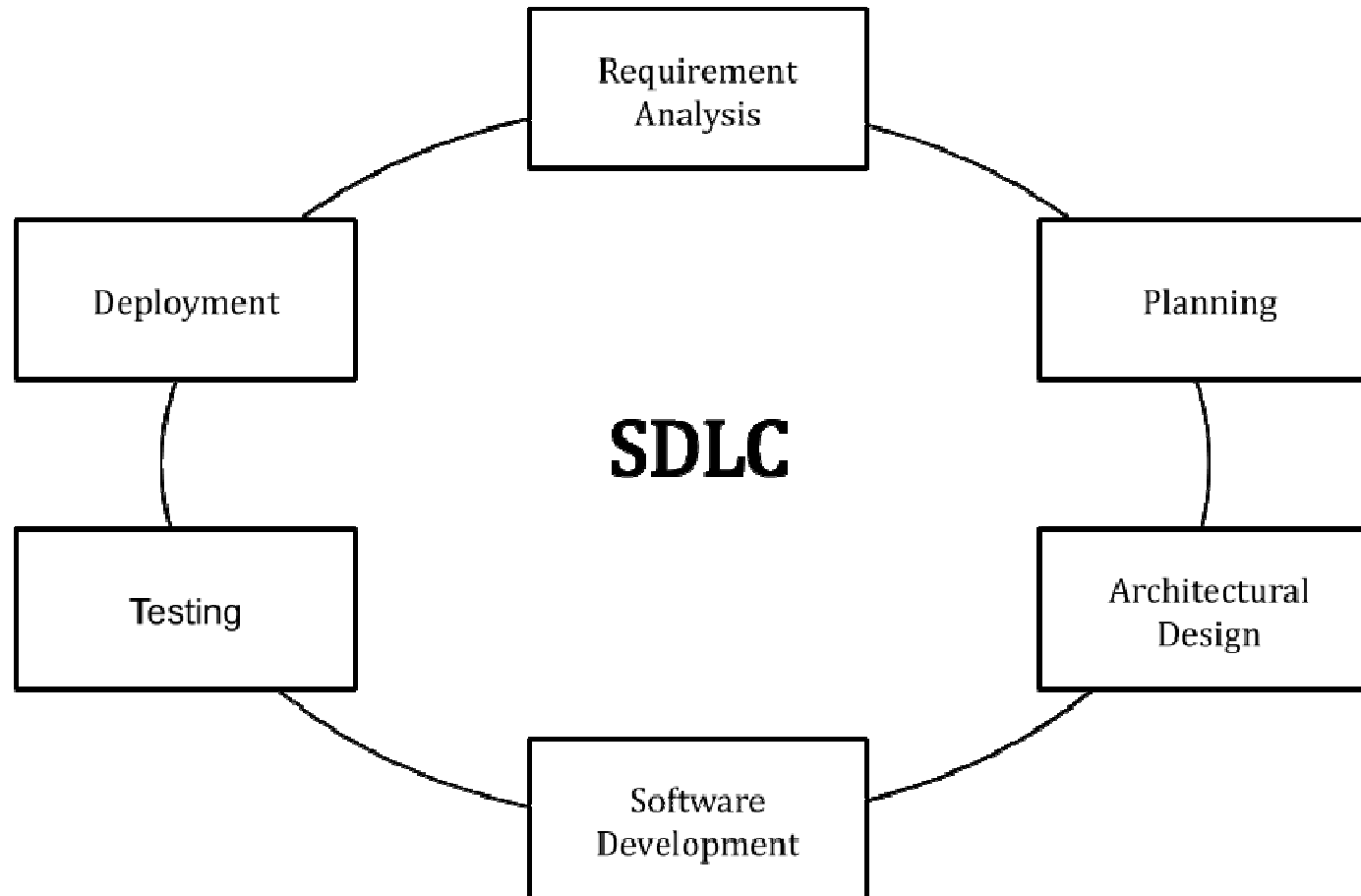
- ▶ to make the most effective use of the people involved with the project.

1.9 SDLC

- SDLC is the acronym of Software Development Life Cycle.
- Software Development Life Cycle (SDLC) refers to a methodology with clearly defined processes for creating high-quality software.
- SDLC is a process that produces software with the highest quality and lowest cost in the shortest time possible.



SDLC



1.9 COST BENEFIT ANALYSIS (CBA)

- ▶ **Cost–benefit analysis** : systematic approach to estimate the strengths and weaknesses of alternatives
- ▶ systematic process for calculating and comparing benefits and costs of a decision, policy or project
- ▶ **CBA has two main purposes:**
 - ▶ To determine if an investment/decision is sound : verifying whether benefits outweigh the costs
 - ▶ To provide a basis for comparing projects : which involves comparing the total expected cost of each option against its total expected benefits.
- ▶ In CBA, benefits and costs are expressed in monetary terms
- ▶ Closely related, but different, formal techniques :
 - ▶ cost-effectiveness analysis, cost–utility analysis, risk–benefit analysis, economic impact analysis, fiscal impact analysis, and social return on investment (SROI) analysis.

1.10 PROJECT STAKE HOLDERS

- ▶ **Project Stakeholder** is a person, group of people or an organization that has any kind of interest in the project.
- ▶ Project stakeholders can be grouped as:
 - ▶ Internal to the project team
 - ▶ External to the project team but within the same organization
 - ▶ External to both the project and the organization.
- ▶ The following are the list of project stakeholders:
 - ▶ Project leader
 - ▶ Senior management
 - ▶ Project team members
 - ▶ Project customer
 - ▶ Resource Managers
 - ▶ Line Managers
 - ▶ Product user group
 - ▶ Project testers
 - ▶ Any group impacted by the project as it progresses
 - ▶ Any group impacted by the project when it is completed
 - ▶ Subcontractors to the project
 - ▶ Consultants to the project

1.11 ROLE OF PROJECT MANAGER

- ▶ A project manager is a person who is responsible for making decisions.
- ▶ The project manager should control risk and minimise uncertainty.
- ▶ Project managers use project management software, such as Microsoft Project, to organise their tasks
- ▶ **Roles and Responsibilities of Project Manager**
 - ▶ Planning and Defining Scope
 - ▶ Activity Planning and Sequencing
 - ▶ Resource Planning
 - ▶ Developing Schedules
 - ▶ Time Estimating
 - ▶ Cost Estimating
 - ▶ Developing a Budget
 - ▶ Documentation
 - ▶ Creating Charts and Schedules

▶ **Roles and Responsibilities of Project Manager Contd.....**

- ▶ Risk Analysis
- ▶ Managing Risks and Issues
- ▶ Monitoring and Reporting Progress
- ▶ Team Leadership
- ▶ Strategic Influencing
- ▶ Business Partnering
- ▶ Working with Vendors
- ▶ Scalability, Interoperability and Portability Analysis
- ▶ Controlling Quality
- ▶ Benefits Realisation

Software Project Manager



Image Courtesy : <https://www.invensislearning.com/articles/pmp/what-is-a-project-team-and-who-all-are-involved>

1.12 SOFTWARE TOOLS USED IN PROJECT MANAGEMENT

- ▶ **Wrike**
- ▶ **Asana :**
 - ▶ Asana is a recommended task and project management app for teams that wish to communicate and collaborate efficiently and effectively.
- ▶ **Smartsheet**
- ▶ **JIRA**
- ▶ **Clarizen**
- ▶ **Trello**
- ▶ **Zoho Projects**

1.13 CHECK POINTS AND PROCESSES OF PROJECT

▶ **Major milestones.**

- ▶ These system wide events are held at the end of each development phase.
- ▶ They provide visibility to system wide issues, synchronize the management and engineering perspectives, and verify that aims of the phase are achieved.

▶ **Minor milestones.**

- ▶ These iteration-focused events are conducted to review the content of an iteration in detail and to authorize continued work.

▶ **Periodic Status assessments.**

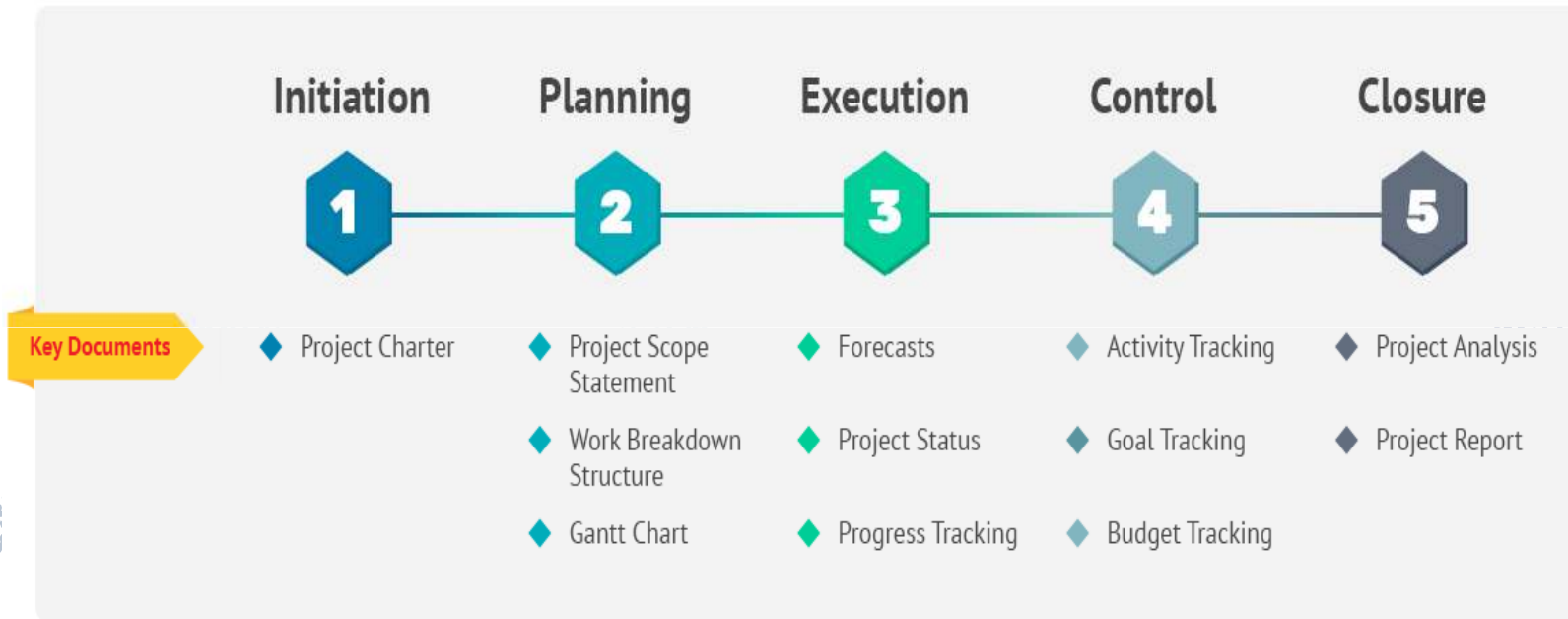
- ▶ These periodic events provide management with frequent and regular insight into the progress being made.

1.14 PROJECT PROCESSES

- ↓ Projects are composed of processes. A process is a series of actions bringing about a result.
- ↓ Two Categories of Project Processes :
 - ← **Project Management Process** : Concerned with describing and organising the work of the project.
 - ← **Product Oriented Processes** : Concerned with specifying and creation of project product.

PROJECT PROCESSES

- ↓ Process of project management is integrative.
- ↓ An action in one area will usually affect other areas.
- ↓ For example, a scope change will almost always affect cost and schedule estimates.



1.15 Project Management Processes

Three basic management processes :

- ← **Planning**-devising a workable scheme to accomplish an objective
- ← **Executing**-carrying out the plan
- ← **Controlling** - measuring progress and taking corrective action when necessary

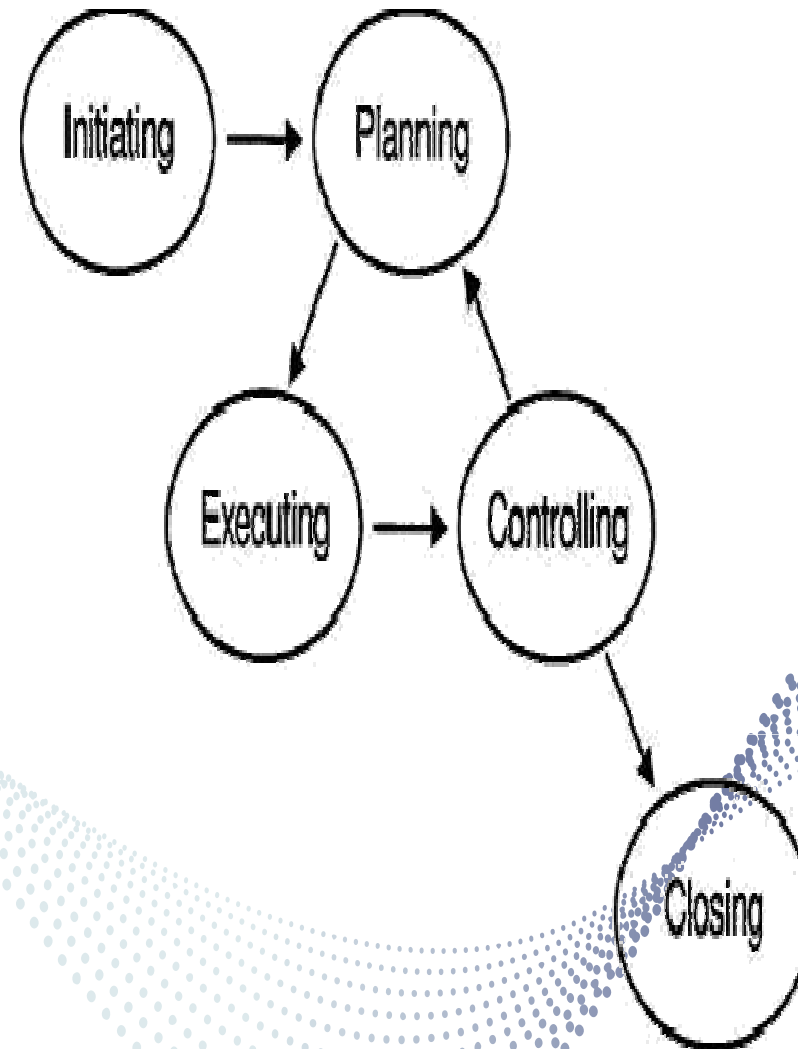
Two additional basic management processes:

- ← **Initiating** - setting overall project direction and defining project objectives
- ← **Closing** - formalizing acceptance of the product of the project and bringing the project itself to an end

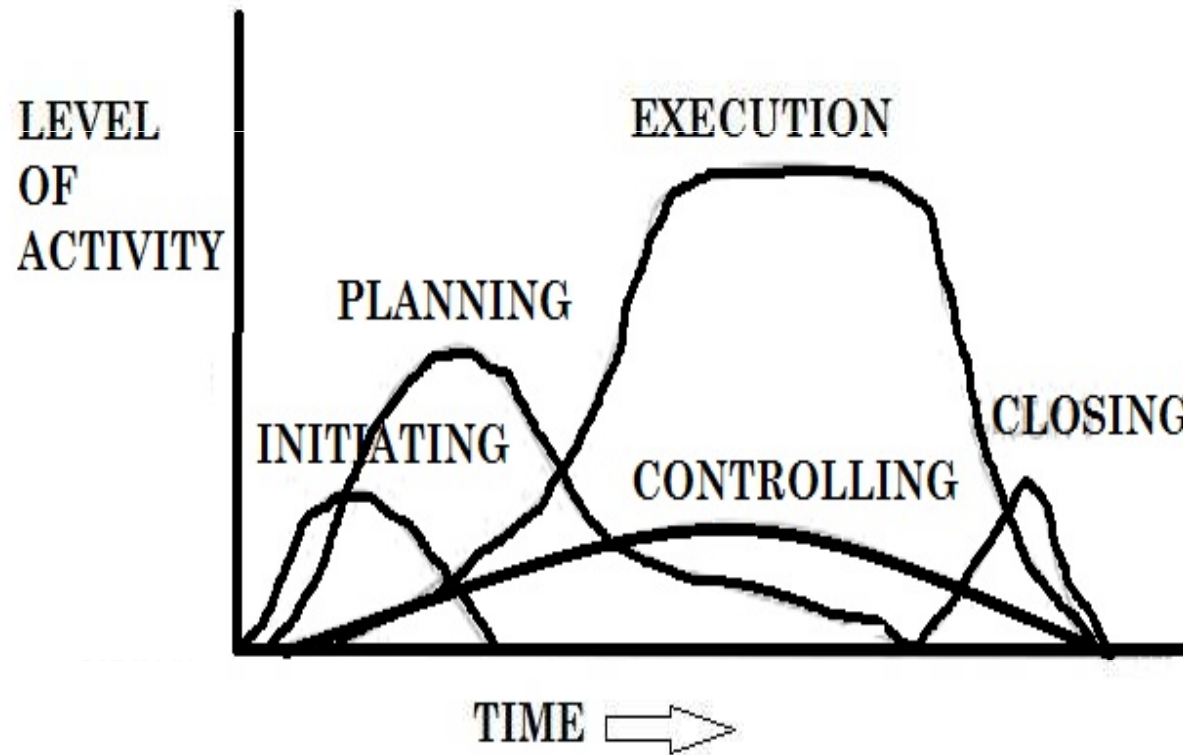
Project Management Processes

- ← **Planning**
- ← **Executing**
- ← **Controlling**

- ← **Initiating**
 - ↓ Feasibility
- ← **Closing**
 - ↓ Turnover



Management Process Over Time



1.15.1 Planning Processes

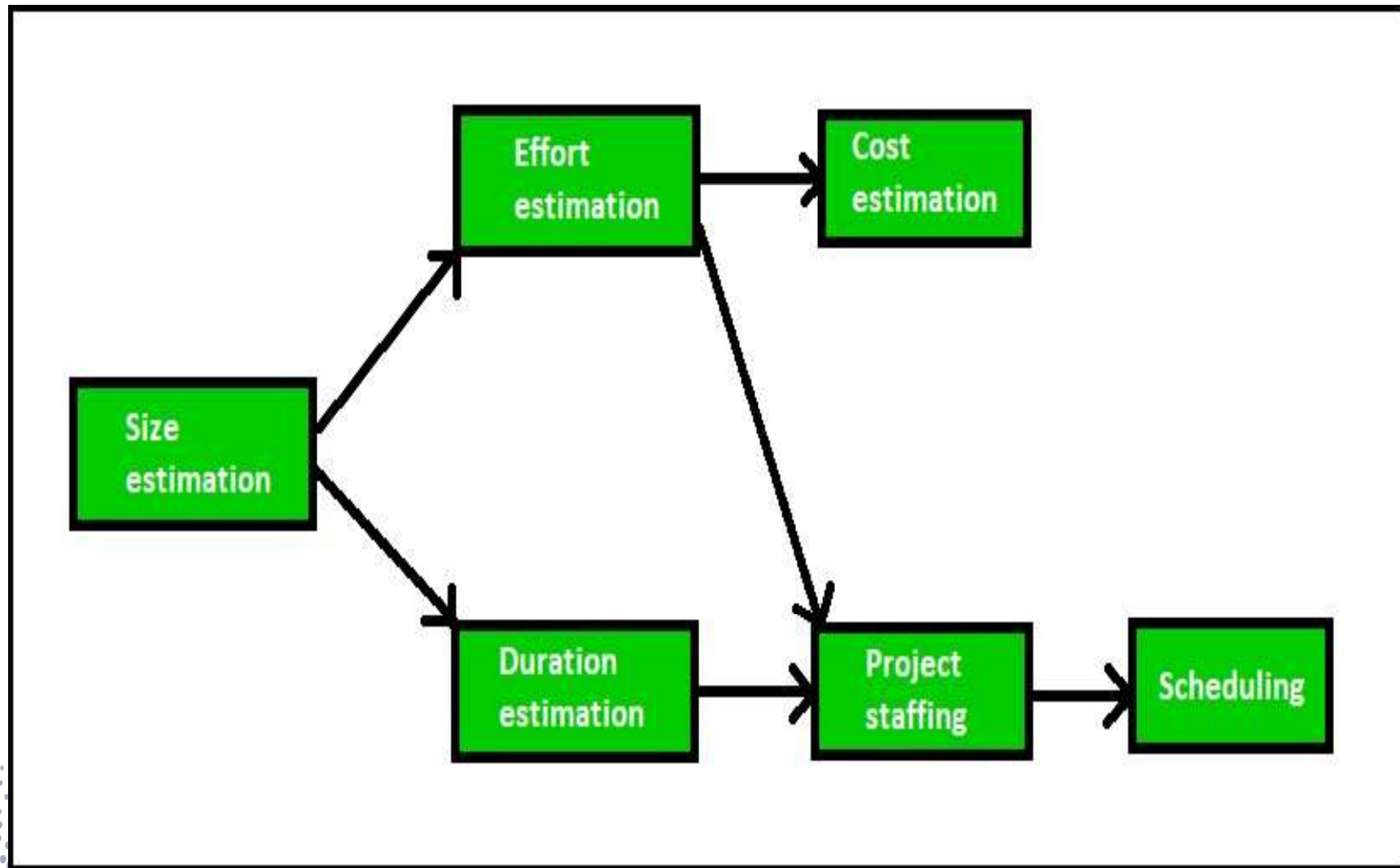
Detail planning processes have clear dependencies.

The dependent planning processes include:

- Scope definition
- Project definition
- Task definition
- Task sequencing
- Duration estimating
- Schedule development
- Cost estimating
- Cost budgeting
- Plan integration



Planning Process Activities



1.15.2 Executing Processes

- This basic process includes the following detail processes:
 - **Plan execution** -carrying out the project plan by performing the tasks identified therein and managing the various technical and organizational interfaces
 - **Contract administration** - managing the contractual aspects of the procured products and services



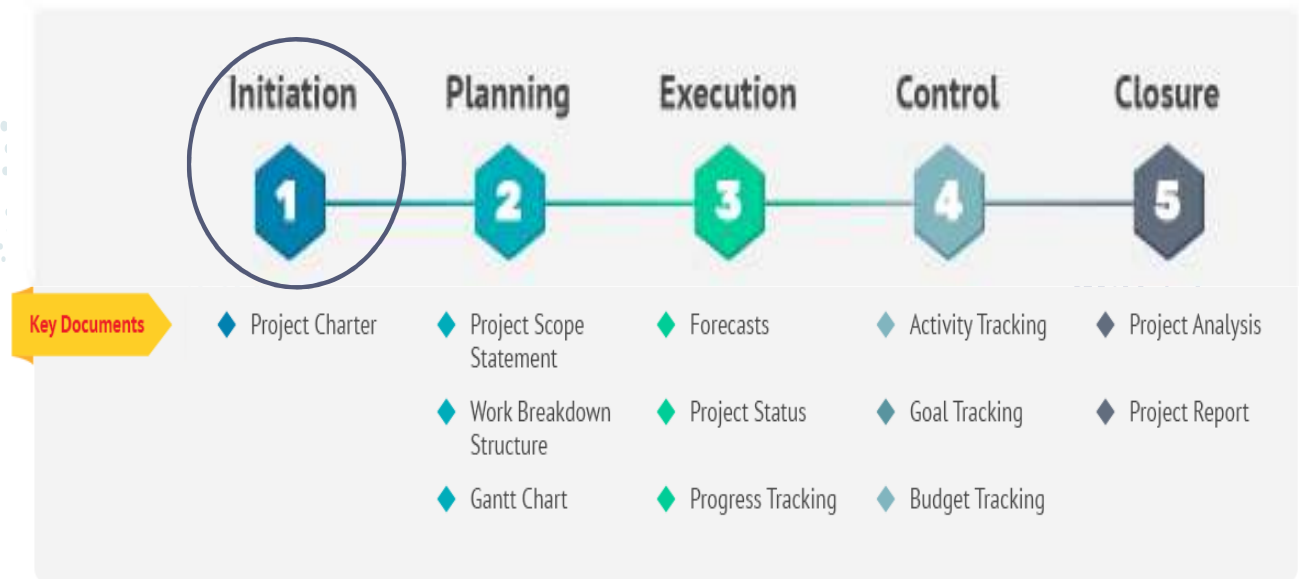
1.15.3 Controlling Processes

- **Progress measurement and reporting-** collecting and disseminating progress information
- **Scope change management** - documenting and controlling changes to project scope
- **Quality control** - measuring project deliverables and activities
- **Time/schedule control** – controlling schedule changes
- **Cost control** - controlling and responding to cost changes
- **Risk control** - responding to changes in risk over the course of the project



1.15.4 Initiating Process

- This basic process includes only one detail process:
 - **Concept development** - describing the product of the project, documenting initial project objectives, and assigning a project manager.



1.15.5 Closing Processes

- This basic process includes the following processes:
 - **Scope verification** -ensuring that the project deliverables have been completed satisfactorily
 - **Contract close-out** - resolution of any outstanding administrative matters and archiving of contract documentation
 - **Project closure** - gathering and disseminating information to formalize project completion



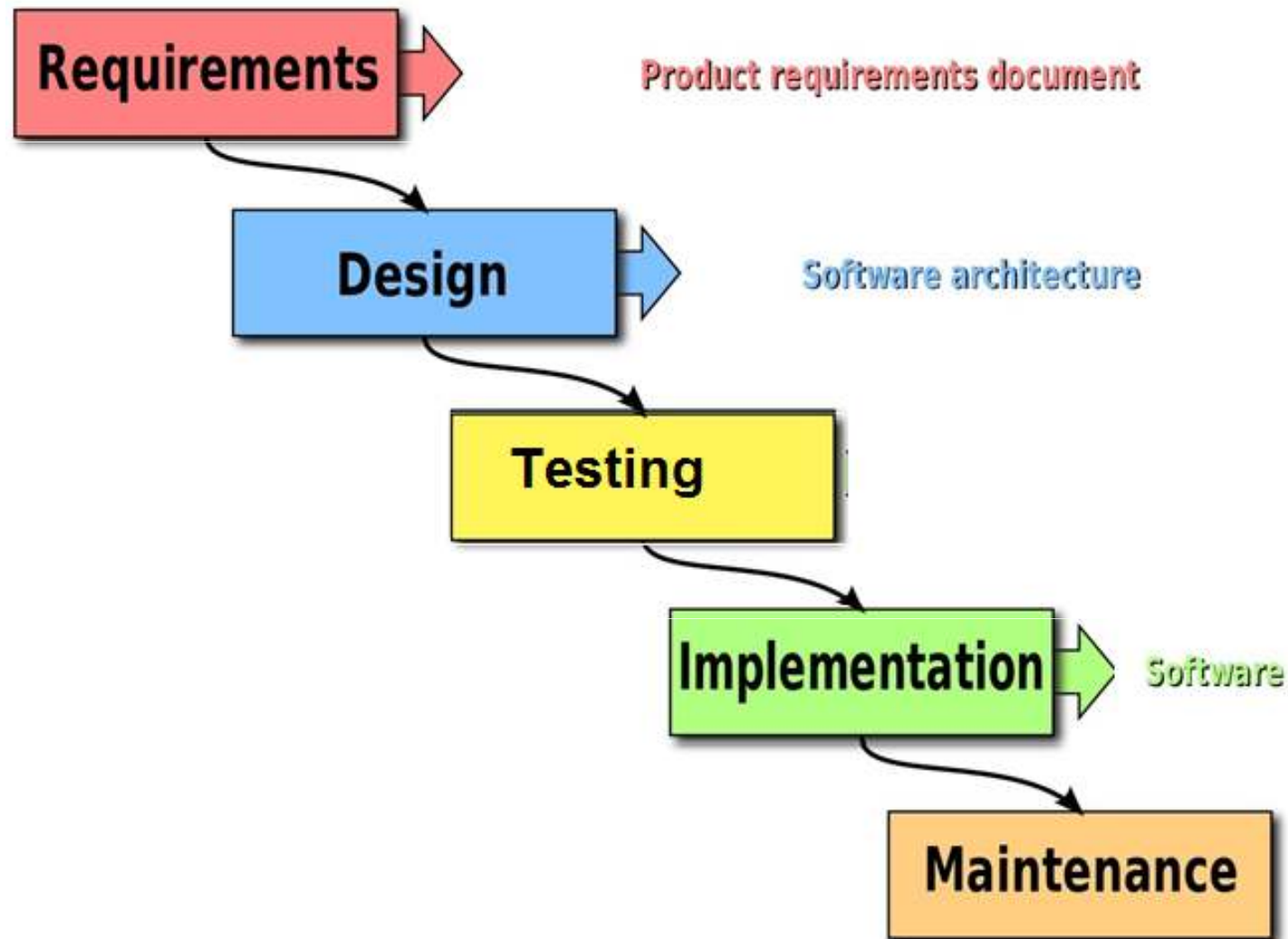
1.16 Process Groups:

- **Five process groups** outline the necessary competencies
- Five essential areas or process groups are:
 1. Initiating Process Group
 2. Planning Process Group
 3. Executing Process Group
 4. Monitoring and Control Process Group
 5. Closing Process Group

Process Interactions

- A process is “a series of actions bringing about a result” while a result is a “concrete outcome” .
- Initiating, Planning, Executing, Controlling, Closing
- These outcomes provide a direct link between the processes.
- **Inputs** -documents (e.g., a scope statement) or documentable items
- **Tools and techniques** -mechanisms applied to the inputs
- **Outputs** -documents that are the result of the process

1.17 Software Development Process



Software Development Team 1/4



Software Development Team 2/4

- ▶ **PROJECT SPONSOR**

- ▶ is the person or group that provides direction and resources, including financial resources for the software project.
- ▶ senior management or director level executives.

- ▶ **SUBJECT MATTER EXPERTS (SME)**

- ▶ or **Domain Expert** is a person who is an authority in a particular area or topic

- ▶ **PRODUCT OWNER**

- ▶ person who represents the business or end-users and is responsible for working with the user group to determine what features will be in the product

Software Development Team 3/4

- ▶ **PROJECT MANAGER (PM)**

- ▶ Project Manager (PM) is responsible for knowing the “who, what, where, when and why” of the software project.

- ▶ **TECHNICAL LEAD**

- ▶ person translates the business requirements into a technical solution.

- ▶ **SOFTWARE DEVELOPERS**

- ▶ software Developers (front-end and back-end) are responsible for using the technical requirements from the Technical Lead to create cost and timeline estimates.

Software Development Team 4/4

▶ **SOFTWARE TESTERS**

- ▶ ensure that the software solution meets the business requirements and that it is free of bugs, errors and defects.
- ▶ **USER ACCEPTANCE TESTERS** : ensure that your new software solution meets various quality assurance (QA) criteria.

▶ **DEPLOYMENT AND MAINTENANCE TEAM**

- ▶ Responsible for delivery and deployment of software
- ▶ Maintenance team : takes care of changes from time to time and trouble shoot the errors during software execution time.

1.18 Project Management Team

- **Project Manager** : PM ensures that the project proceeds and completes within the specified time frame
- **Project Team Member**
 - Project team members are mainly the people who work on various phases of the project.
 - They could be in-house staff or external consultants and may be working on a full-time or part-time basis.
- **Project Sponsor**
 - are typically members of senior management
 - those with a stake in the project's outcome. Project sponsors work closely with the project manager.
- **Business Analyst** : Business analyst recognizes requirements of the organization and suggests solutions to the problems.

1.19 Composition of Project Teams

- Project team's compositions may differ based on organization's culture, scope, and location.
- Dedicated team
- Part time team

Activity for Students....

↳ Mini Project at the end of 5th Semester (Just for your thought process)

↳ Decide on a Project Title

↳ Prepare a SRS

↓ Sample SRS

↳ <https://krazytech.com/projects/sample-software-requirements-specificationsrs-report-airline-database>

↳ <https://www.reqview.com/doc/iso-iec-ieee-29148-srs-example>

↳ http://www.cse.chalmers.se/~feldt/courses/reqeng/examples/srs_example_2010_group2.pdf

↳ Prepare a plan and Schedule for your Miniproject.

Thank You.

REFERENCES

1. Walker Royce: Pearson Education, 2005: Software Project Management.
2. A Guide to the Project Management Body of Knowledge (PMBOK), Project Management Institute, PA, (2004).
3. Harold Kerzner, Frank P. Saladis, Project Management Workbook and PMP/CAPM Exam Study Guide, Wiley Publishers (2006)
4. Claudia M. Baca, Patti, PMP: Project Management Professional Workbook, Sybex, Workbook (2003).
5. Joel Henry, Pearson Education: Software Project Management.
6. Pankajjalote, Pearson Education, 2005: Software Project Management.
7. <https://www.business2community.com/strategy/what-is-the-project-life-cycle-and-how-to-use-it-better-02080105>